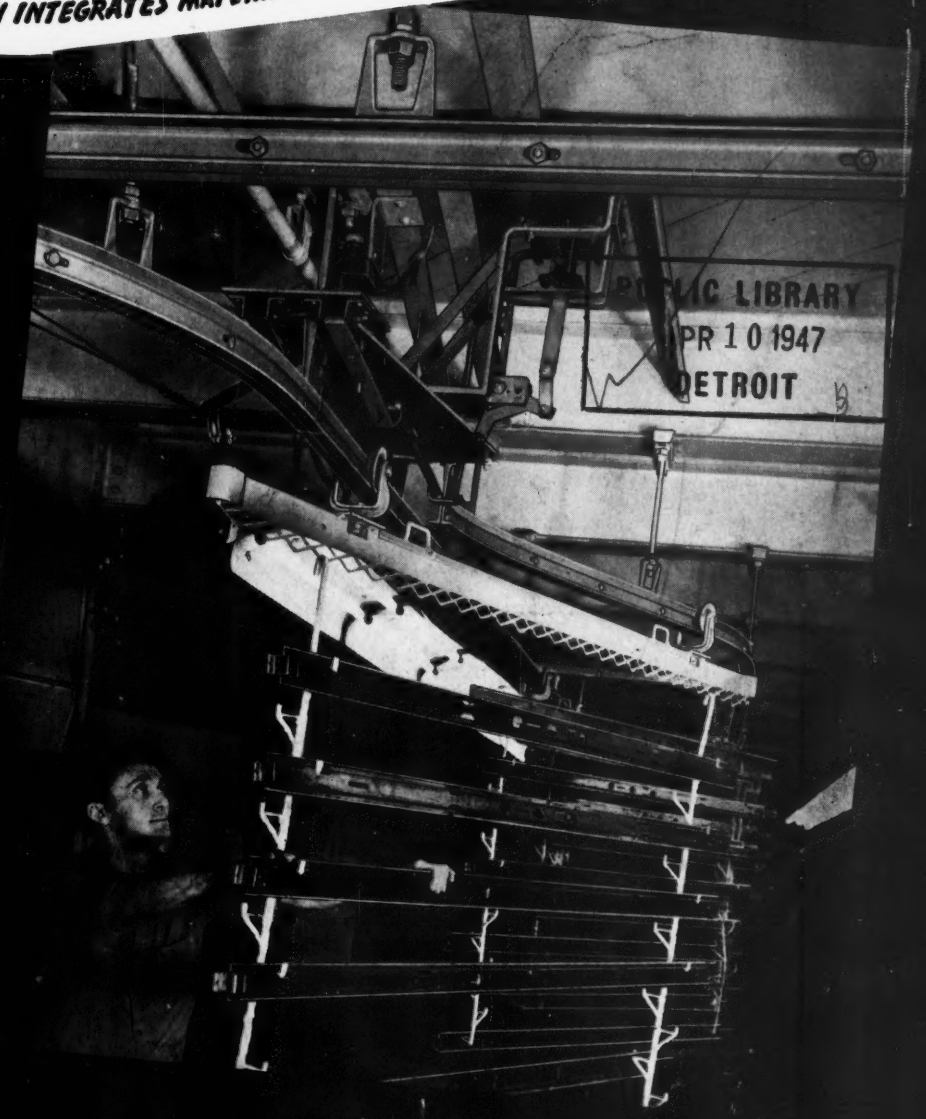
Flow

... THE MAGAZINE WHICH INTEGRATES MATERIAL HANDLING EQUIPMENT INTO THE FLOW OF PRODUCTION



SEE PAGE 21—ANNOUNCING THE FLOW CONTEST

8 Hours Continuous Operation on 1 Gallon of Gas . . . that's

LOW-COST HAULING

for the 19 out of 20 shop loads which are less than 1 ton

It's a cinch for us to prove that Truck-Man is easy on fuel and upkeep—and that's mighty important. But what's more vital to YOU, we can prove that Truck-Man actually costs less to operate than hand lift trucks . . . whether they're pulled, pushed or led about with the aid of power . . . Speedy, flexible and safe, Truck-Man's hydraulic lift and powerful engine spread handling labor over a vastly greater tonnage of material moved.

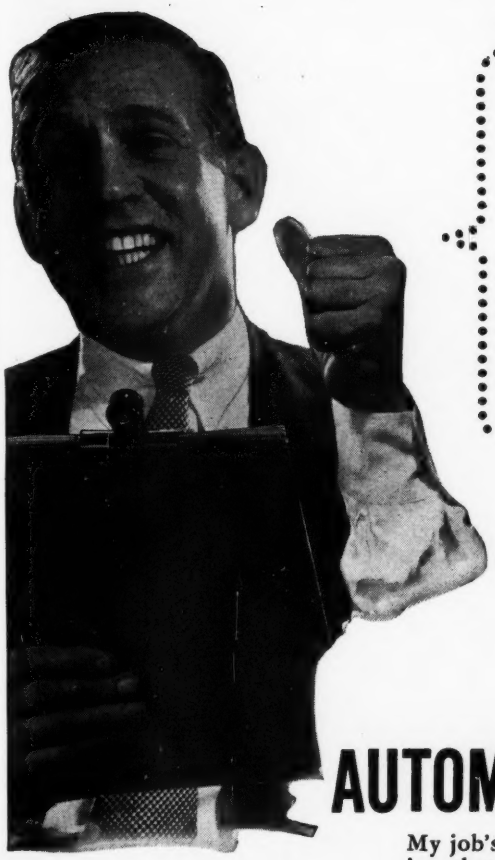
Simple controls are grouped in a 12" circle. Big dual pneumatics provide plenty of traction and riding comfort. The operator *rides with the load.* Instant low or high speeds are at his command. Easy and light maneuverability enable him to turn out a full day's productivity without fatigue or hazard. He's *glad* it's a Truck-Man. And you'll agree that fuel economy is only a drop in the bucket when the red line on your handling costs takes a dive! Check the many Truck-Man features now. Write for new Model D Folder.

Over 70 Truck-Man distributors in principal centers provide standard service

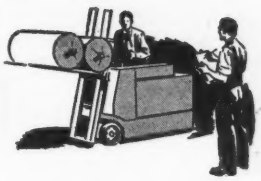
Ask Any Operator About

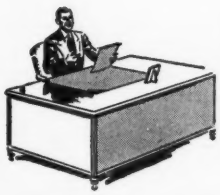
truck-man

1418 West Ganson, **truck-man** INC. Jackson, Mich.



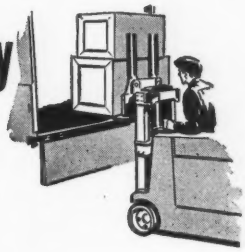
My Help's Happy — They Save Energy!



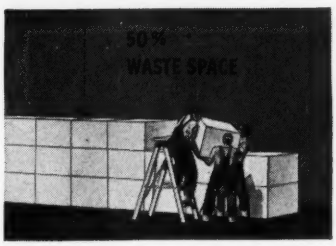


Boss Happy, Handling Costs Cut $11,200.00

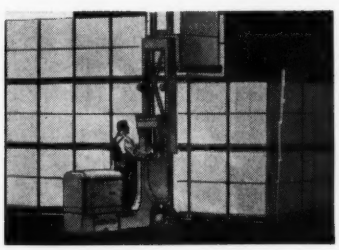
Customers Happy, They Get Better Service!



Thanks To AUTOMATIC ELECTRIC TRUCKS!



OLD WAY: You waste 50% of available storage space when you stack merchandise by hand—waste critical labor, make grueling work of what should be an easy job. Switch to the new way:



AUTOMATIC'S WAY: One man easily and quickly moves material about your plant. And when it's ready for storage, Automatic Electric Trucks again stack it neatly, ceiling high. You save space, cut handling costs!

My job's to keep material moving through the plant. Getting merchandise on its way to customers. Keeping labor happy, boss too. Automatic Electric Trucks help me do just that!

They're the babies that have pulled me out of many a tight spot . . . solved our problem of lifting, moving and stacking products ceiling high—getting material to and out of production—moving merchandise on schedule for quick customer delivery.

Expensive medical supplies which we make, now go through our plant with damage loss just about zero. Five to six hundred pound bales of cotton, many rolls of gauze and bags of starch, all are feather-light when moved and lifted with these miracles of electric power. Scores of other heavy moving and lifting operations are handled just as efficiently.

Labor goes for these trucks that lighten their load. And when it comes to figures, the two trucks we have, paid a 140% return on their low original cost . . . $11,200.00 saved over handling materials by hand. My boss likes that—and so will yours. Let an ATCO Specialist show you what they can do in your plant. Send the coupon.

Be Sure to See ATCO'S New Film

"PAY LOADS...PAY OFF"

Automatic ELECTRIC TRUCKS — Lighten LIFE'S LOADS

AUTOMATIC TRANSPORTATION CO.
DIV. OF THE YALE & TOWNE MFG. CO.
141 West 87th Street, Dept. D7, Chicago 20, Ill.

- ☐ Send information on Automatic Electric Trucks.
- ☐ Have an ATCO Specialist make a free survey of my materials handling operations.
- ☐ Schedule me for an early showing of ATCO's new movie, "Pay Loads Pay Off."

Company Name.....

By.....*Position*.....

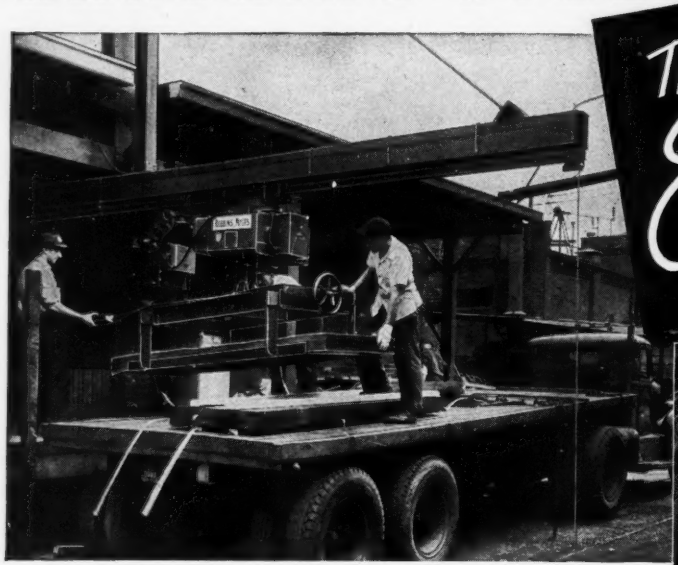
Street Address.....

City.....*Zone*.....*State*.....

MANUFACTURERS OF THE FAMOUS TRANSPORTERS, TRANSTACKERS AND SKYLIFT ELECTRIC TRUCKS

HANDLING STEEL

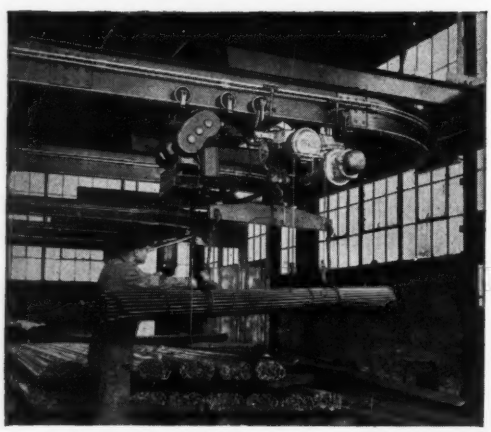
The Easy Way!



Power operated unit unloads steel by pushbutton control

Electric hoist with special hook, handles coils to process.

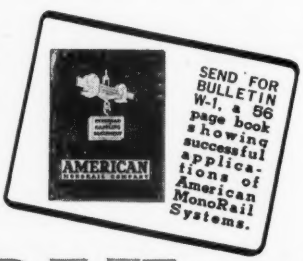
Power crane accurately spots 2-ton loads.



MonoTractor and 3-Ton hoist moves bar stock.

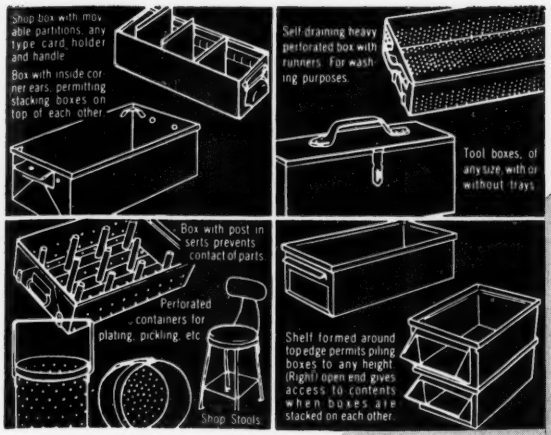
This tough job is made easy from start to finish —unloading stock from truck, to storage, to machines, to shipping—American MonoRail Systems, to fit any budget, afford faster handling, accurate spotting, reduced fatigue, added safety and greatly reduced damage.

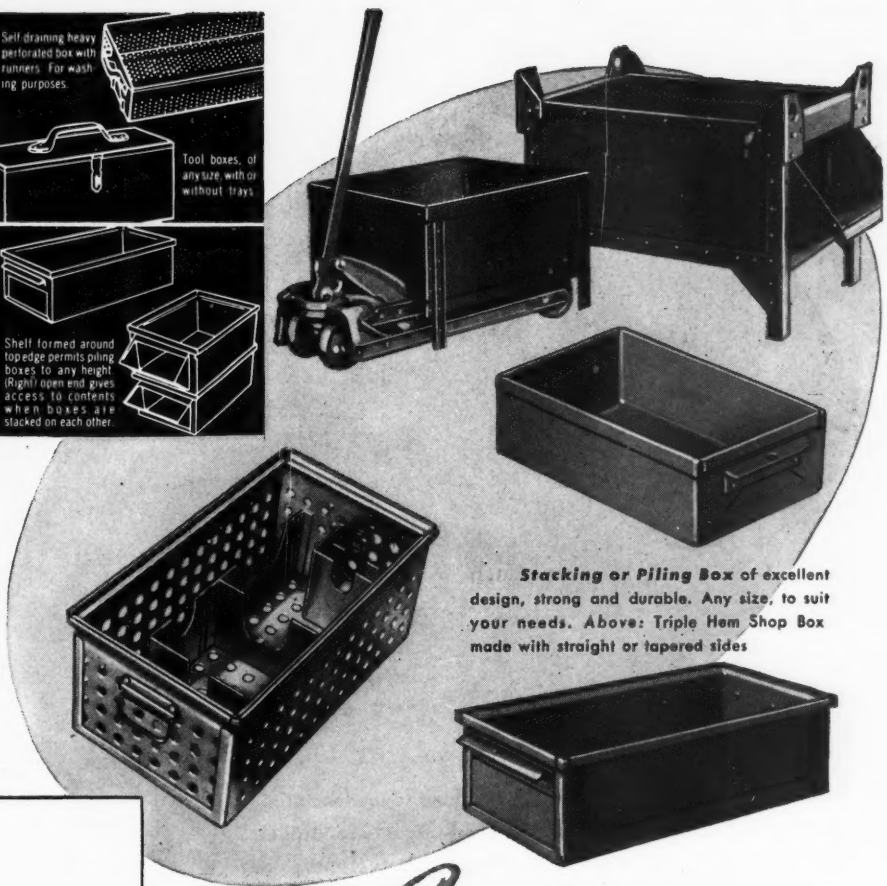
American MonoRail Equipment saves one company $20 on every truck unloaded; another saved $150 in the first four months. With thousands of installations to draw from, American MonoRail Engineers are well qualified to offer solutions involving overhead handling equipment. This service is offered without obligation.



THE AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE • CLEVELAND 7, OHIO





Steel Piling Box **with fixed or removable partition designed to hold one set of parts needed for any given assembly or sub-assembly. Big time-saver.**

Stacking or Piling Box **of excellent design, strong and durable. Any size, to suit your needs. Above: Triple Hem Shop Box made with straight or tapered sides**

Shop Barrels, **any style or size, built for long life and hard service.**

Shop Stools **with steel, solid wood or laminated wood seats. Sturdy reinforced legs, of any desired height.**

Comfortable Back Rests **of several different designs, may be had at a slight extra cost.**

TO KEEP PRODUCTION *flowing smoothly*

Where small, loose products are used or produced, perfecting the materials handling system is often the most important factor in attaining lower production cost. An essential part of the system is properly designed, light and strong metal shop containers for the pickup, collection, and conveyance of materials to and from machines, finishing, assembly, packaging and storage. Cleveland shop boxes, barrels, cans, pans and pails are usually custom-made, because the small extra first cost is trifling compared with the advantages gained, year in and year out, by having containers of exactly the right size, shape and design to fit individual needs and special handling requirements.

SHOP EQUIPMENT DIVISION
Cleveland Wire Spring Co.
5250 BROOKPARK RD.•CLEVELAND 9, OHIO

Cleveland **STEEL SHOP EQUIPMENT**

CLEVELAND WIRE SPRING CO.
2012 West 25th Street, Cleveland 13, Ohio
Subsidiary of Reynolds Spring Company, Jackson, Mich.

ROLLWAY'S long experience in bearing manufacture makes its Steel-Cage-Type Roller Bearings rugged, efficient and economical. These are the qualities required for good performance, low maintenance cost and the easy sale of material handling equipment.

The materials, workmanship, fits and finish of these bearings are strictly in line with the best standards of equipment manufacture. They are made to withstand the stresses imposed by heavy handling. They hold starting and operating torque at a minimum . . . help your machine give top performance with a lower power input—and last longer with fewer replacements.

Steel-Cage-Type Roller Bearings For Lower Cost

They save you money because you can assemble them more cheaply than most bearings. Simply press the inner race on the shaft during bench assembly, while you place the rollers and outer race in the housing. *You can do this right on the floor with minimum time and labor.*

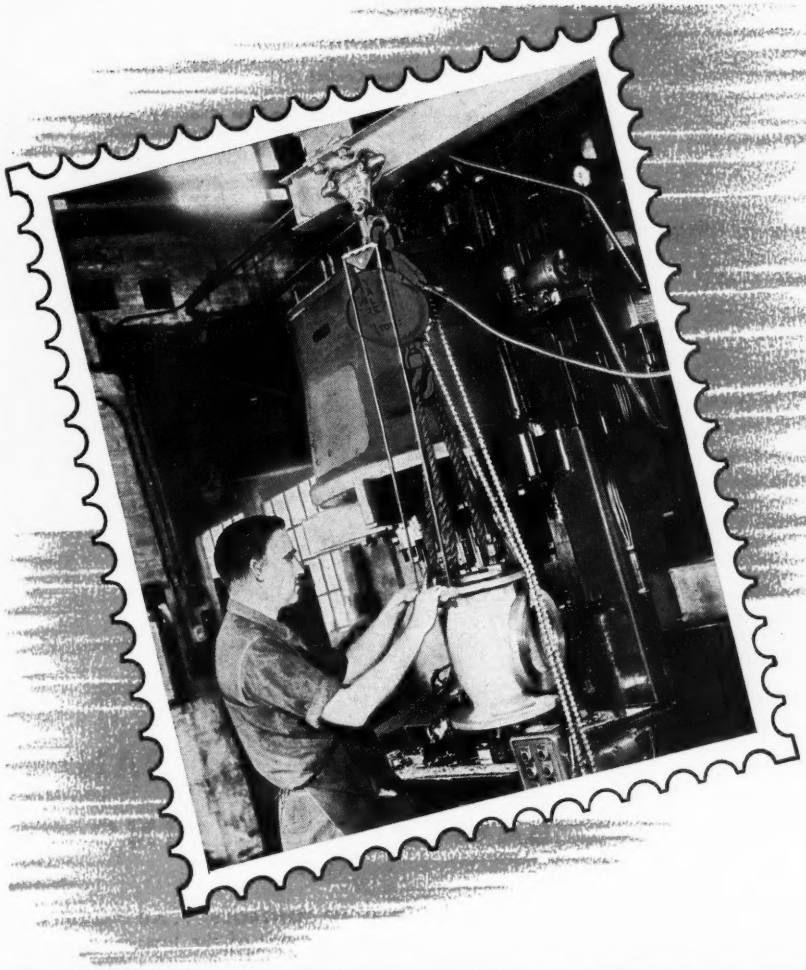
FREE SERVICE!

Rollway Engineers will be glad to help you select the right bearings for your particular needs. Send us a print or detailed statement of load, speed and operating conditions for *free analysis and recommendation.*

ROLLWAY BEARINGS

ROLLWAY BEARING COMPANY, INC., SYRACUSE, N. Y.

SALES OFFICES: Philadelphia • Boston • Pittsburgh • Cleveland • Detroit • Chicago • Minneapolis • Houston • Los Angeles



PER-HOUR COST FOR THIS YALE POWER—

IS NO MORE THAN THIS POSTAGE STAMP

Imagine moving tons of castings for pennies. That's all it costs when this Yale Midget King Electric Hoist does the lifting. It would cost you many times that amount if muscle did the work.

Not only is material handling much less costly when Yale power replaces man power, but you also get more output per man hour, faster, safer, more efficient handling of material.

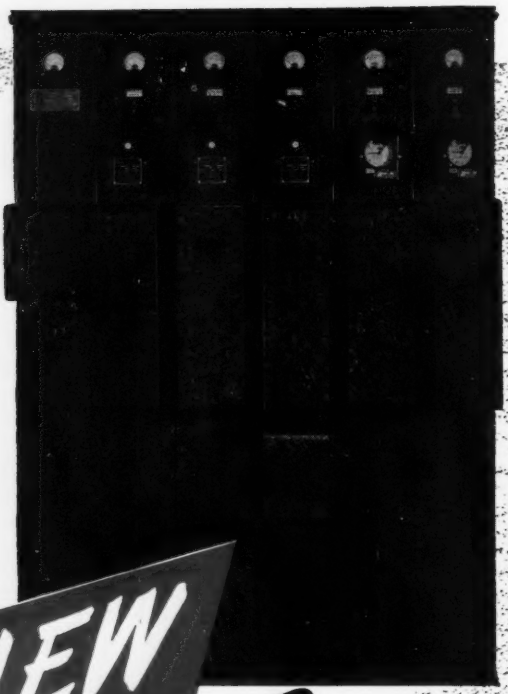
For more detailed facts on how Yale Material Handling Machinery can cut your production costs, phone our nearest representative, or write direct to: The Yale & Towne Manufacturing Co., 4530 Tacony Street, Philadelphia 24, Pennsylvania.

YALE

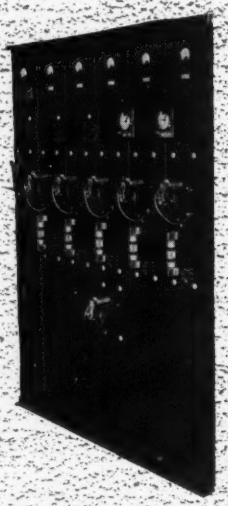
MATERIAL HANDLING MACHINERY

CUTS PRODUCTION COSTS . . . SAVES TIME . . . SAVES EFFORT . . . PROMOTES SAFETY

KRON INDUSTRIAL SCALES • HOISTS—HAND AND ELECTRIC • TRUCKS—HAND LIFT AND ELECTRIC



Illustrated from left to right, both with and without protective control covers are: Generator Control Section; Lead-Acid Battery Circuit; Lead-Acid Battery Circuit with Selector Switch; Two-Rate Charging Circuit; Edison Battery Circuit with Selector Switch; and Edison Battery Circuit.



NEW EP *Sectionalized* CONTROL PANELS *for* BATTERY CHARGING

1—**EASY TO INSTALL** . . . Shipped completely assembled, this lightweight panel is simply stood on its intended location and fastened to the nearest wall by two angle-iron brackets.

2—**EASY TO ADD MORE CIRCUITS** . . . Since each section comprises a complete charging circuit, it is only necessary to secure a few frame bolts; extend the main power bus with a jumper; and lengthen the control wires.

3—**STANDARDIZED CONSTRUCTION** . . . Illustrated above are the standard generator control section and the five standardized circuit sections that meet *all* battery-charging requirements, lead-acid or Edison. The panel height of 76″ conforms to the standard height of industrial switchboards.

4—**OCCUPIES LITTLE FLOOR SPACE** . . . Each section measures only 9″ wide. Allowing a 24″ clearance from the supporting wall to permit back-of-board inspection, a five-circuit panel occupies only 9 square feet.

5—**TOTALLY ENCLOSED CONTROLS** . . . All controls are mounted on the front of the board within protecting covers. Dust, dirt and other harmful elements are barred. Covers are easily removed (fastened with only one screw) to permit routine inspection and maintenance.

6—**PROVIDES VISUAL CONTROL OF CHARGING** . . . When indicating lamp at top of board lights, it indicates that the circuit needs attention; either placing a battery on charge or removing the completely recharged battery.

7—**UNIFORM APPEARANCE** . . . Matches the present-day trend toward improved industrial-product design.

This new sectionalized panel simplifies negotiation, ordering and manufacturing. It permits complete standardization. Special engineering is eliminated. The Buyer gets a better product within a shorter time.

Ask for Bulletin 203

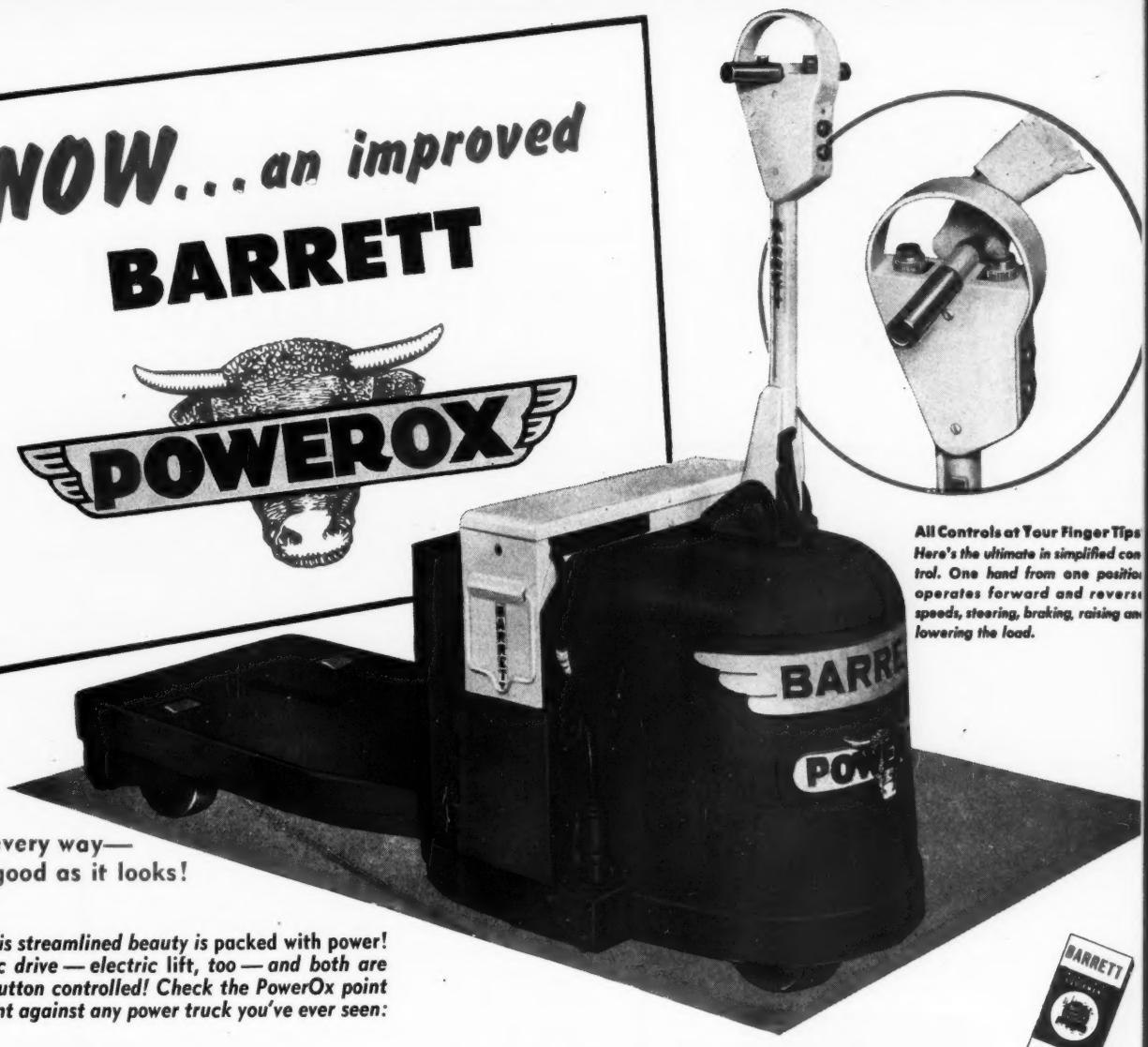
EP X-31

THE ELECTRIC PRODUCTS COMPANY

1730 CLARKSTONE ROAD CLEVELAND 12, OHIO

NOW... an improved BARRETT

POWEROX



All Controls at Your Finger Tips
Here's the ultimate in simplified control. One hand from one position operates forward and reverse speeds, steering, braking, raising and lowering the load.

In every way—
as good as it looks!

Yes, this streamlined beauty is packed with power! Electric drive — electric lift, too — and both are push button controlled! Check the PowerOx point for point against any power truck you've ever seen:

- **TWO CAPACITIES** . . . 4000 or 6000 pounds.
- **ELECTRIC TRAVEL** . . . Heavy duty motor . . . large diameter, wide face front wheel. PowerOx travels at steady walking speed whether empty or loaded—no speed-ups or lagging.
- **ELECTRIC LIFT** . . . Full 4-inch lift in 4 seconds. Aircraft type hydraulic gear pump is in direct connection with drive motor.
- **HIGH CLEARANCE** . . . Sturdy, deep-section frame will not snag on inclines, door sills, etc. The PowerOx is available in 6", 7", 9" and 11" height—all with a full 4-inch lift.
- **STEERING** . . . Steer with full power through 270 degrees—greater than any other truck!
- **BRAKING** . . . Brake with handle in horizontal or vertical position. Brakes are automatic, automotive type . . . respond instantly to a slight pressure on handle.
- **CONTROL** . . . Control with your finger tips the two speeds forward, two reverse, also lifting and lowering—all with the handle in any position!

Full details on the improved PowerOx are yours for the asking. Drop a card to

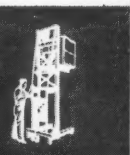
BARRETT-CRAVENS COMPANY

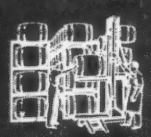
3257 West 30th Street • Chicago 23, Illinois

Representatives in All Principal Cities

Canadian Licensee: S. A. Armstrong, Ltd. • Toronto, Canada

Send for the little book that saves big money—your Free copy of the Barrett Jobbing Catalog!

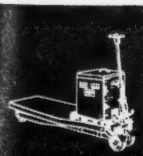

PORTABLE ELEVATORS

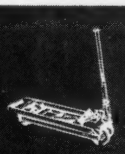

STEEL STORAGE RACKS

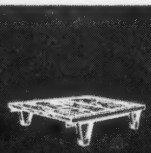
BARRETT

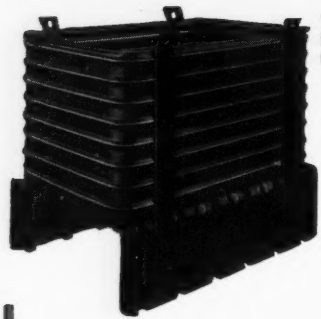
ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT

Barrett Handling Equipment

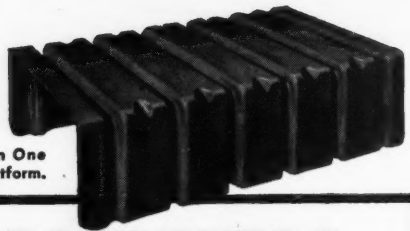






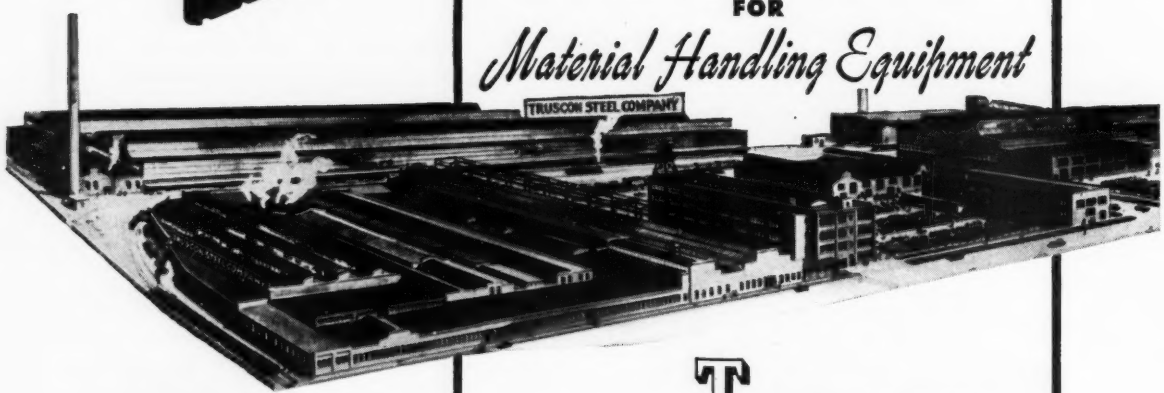


Type PB-120L Truscon Box and Platform with full length lifting lugs.



Type P-1. Truscon One Piece Steel Skid Platform.

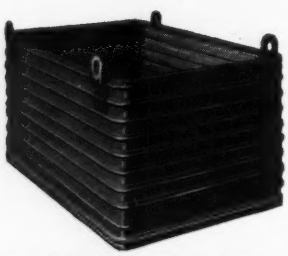
HEADQUARTERS
FOR
Material Handling Equipment



THE SUCCESS of modern production methods depends upon the efficiency with which materials and products in various stages of fabrication can be handled.

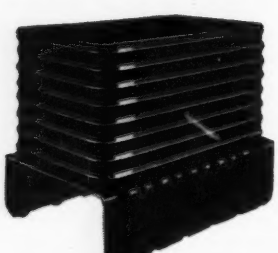
Truscon's Pressed Steel Division—nationally known for the quality of its products and the dependability of its service—is fully equipped and prepared to handle your material handling equipment requirements. The Pressed Steel Division's central location, moreover, assures efficient service for all your needs. Write for free catalog describing the complete line of Truscon Steel Boxes and Steel Skids.

TRUSCON
STEEL COMPANY
PRESSED STEEL DIVISION
6202 Truscon Ave. • Cleveland 4, O.
Subsidiary of Republic Steel Corp.



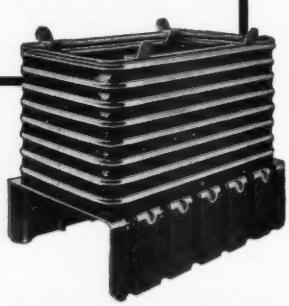
Type B-80C Truscon Box Equipped for Crane Handling.

Type PB-650 Truscon Box and Platform with sliding End Door.



Type PB-120 Truscon Steel Box and Platform.

Truscon Double Face Steel Pallet.



Type PB-120T. Truscon Steel Box and Platform with Tiering Lugs.

HERE'S WHAT A *Flow* SUBSCRIPTION DOES FOR YOU!

"Men in the News"

YOU ARE NEWS WHEN you make a change or do something unusually well, others like to know about it. FLOW tells them.

When you see others promoted, solving a difficult problem, performing an outstanding job, your own efforts are stimulated. So in FLOW, you read about men on their way up—how they plan, experiment, put new ideas into practice to speed production and profits for their company.

When you or your men have any news that might prove of interest to FLOW readers, send it in. By helping others, you help yourself. Because FLOW measures the value of contributions on the merits of the contribution itself, it serves all—and that is one of the secrets of FLOW'S great success.

"Catalogues, Literature and Bulletins"

YOU ARE INFORMED HOW can you compare values if you do not have the *latest* published information and the latest prices?

This department keeps FLOW subscribers informed of all helpful literature published for free distribution in the field covered by FLOW; a much more comprehensive and valuable service than you may imagine.

FLOW not only reviews almost every such bulletin published, and, if helpful, lists it, but also offers to obtain it for the subscriber.

Such helpful service saves FLOW subscribers time and trouble, as they merely make their request on the coupon appearing in each issue of FLOW, and FLOW does the rest without cost or obligation.

"New Products"

YOU ARE AHEAD THIS department alone should warrant your subscription to FLOW—because big savings, fresh opportunities, quick advantages come only from new or improved products. Since every manufacturer is constantly making improvements, the buyer first to know about them has an enviable advantage.

Since FLOW field men are usually first to know of these new products and developments, FLOW readers are usually first also to know about them.

FLOW does not wait until a new product is on the market, but combs industry to see what is coming out. Anything planned to facilitate the movement or handling of materials is quickly reported—anything that in any way can make your job easier and profits more certain, or helps labor to perform its task with more certainty and less backache.

"Men Wanted, Jobs Wanted, Lines Wanted"

YOUR OPPORTUNITIES YOU never know when you may need *quickly* a different job, another man, or a new line—so FLOW runs this department each month to help you get what you need *without delay*.

Here you find good men looking for better jobs — better jobs looking for good men — new lines to increase sales — opportunities for everybody — all presented in an economical orderly form for ready reference.

If you have the job, but no man — or the man but no job; if you have a new line but need distributors — or have distributors but need lines — consult this department each month. It is your opportunity column. Watch it. Advertise in it.

Don't Miss a Single Issue
Start *Your* Subscription Right Away

You'll enjoy *Flow* as you do your Sunday paper . . . It's full of news stories and pictures from the production front.

RETURN SUBSCRIPTION COUPON NOW!

Please enter my subscription for FLOW magazine for

☐ 1 year $3.00

☐ 2 years $5.00

Canada, $4.00 per year; 2 years, $8.00; Foreign $5.00 per year flat.

My name _____ and _____ Title _____

Check enclosed ☐ My company's name _____

Send bill ☐ My company's product _____

Our order No. _____ Street address _____

City _____ Zone _____ State _____

MOBILIFT

...a "Capital" idea!

Mobilift enables you to "Capitalize" on the money you spend for materials handling. Think it over a minute and you'll see why. Money spent for hand labor is gone forever. But money spent for a Mobilift becomes a capital asset. You can use it over and over for years of more efficient materials handling. It earns a definite return. You can write depreciation on it. And best of all it saves time, space and money every day in your plant. Capitalize on a Mobilift system!

SALES OFFICES:

34-48 Steinway St., Long Island, N.Y.
2430 South Parkway, Chicago 16, Ill.
107 Walton Street N. W., Atlanta, Ga.

MOBILIFT *Moves Materials like a Giant!*

GENERAL EQUIPMENT CO. ★ 835 S. E. Main Street, Portland 14, Oregon

the BUDA Chore Boy TRACTOR

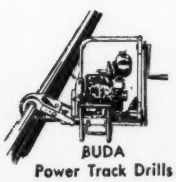
BUDA now offers the latest addition to its popular line of Industrial Trucks . . . the Chore Boy *TRACTOR*, engineered for fast, low-cost towing in and around terminals—warehouses—shops . . . wherever materials must be handled. Here are some of the new *TRACTOR'S* features:

★ 4-cycle air-cooled gasoline engine ★ Speeds up to 10 m.p.h. ★ Powerful—1050 pound drawbar pull. ★ Welded all-steel frame and body ★ Standard foot brake, plus automatic safety brake ★ 3 speeds forward—1 reverse.

Get the complete story about the new Chore Boy *TRACTOR* right now. Write for Bulletin 1322 today.

BUDA
Rail Benders

BUDA
Lifting Jacks



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when parts come THRU-THE-AIR!

No sooner is one part lowered into place than the next is on its way. Traveling "thru-the-air" via Zip-Lift Electric Hoist, it moves quickly and directly into position. And this with no effort by the operator save the mere pushing of buttons!

That's the beauty — and *economy* — of handling materials "thru-the-air." There's no waste effort, no delay, no loss of valued floor space. Best of all, "thru-the-air" handling lends itself to many different operations, even to carrying the load from the raw material stage right on through to the finished product!

Your inquiries are invited

Here's everything you want to know about P&H Zip-Lifts . . . applications, pictures, specifications. It's Bulletin H20-3—yours for the asking.

the "Extras" are standard equipment, added values on P&H Zip-Lift Hoists

- Shaved gears for lifetime service . . . all bearings grease-sealed.
- Motors specifically designed and built by P&H for hoist service — high starting torque, frequent reversal, etc.
- Effortless push-button control . . . equally effective on hook, jib, or trolley operation.
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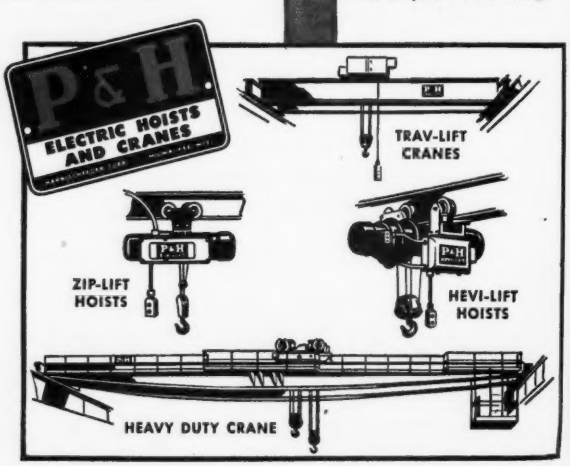

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HOISTS • WELDING ELECTRODES • MOTORS P&H EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

PILE UP SAVINGS

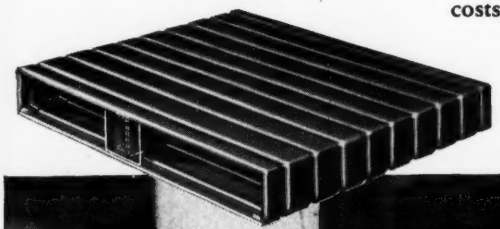
...with UNION METAL *Engineered* Materials Handling Equipment

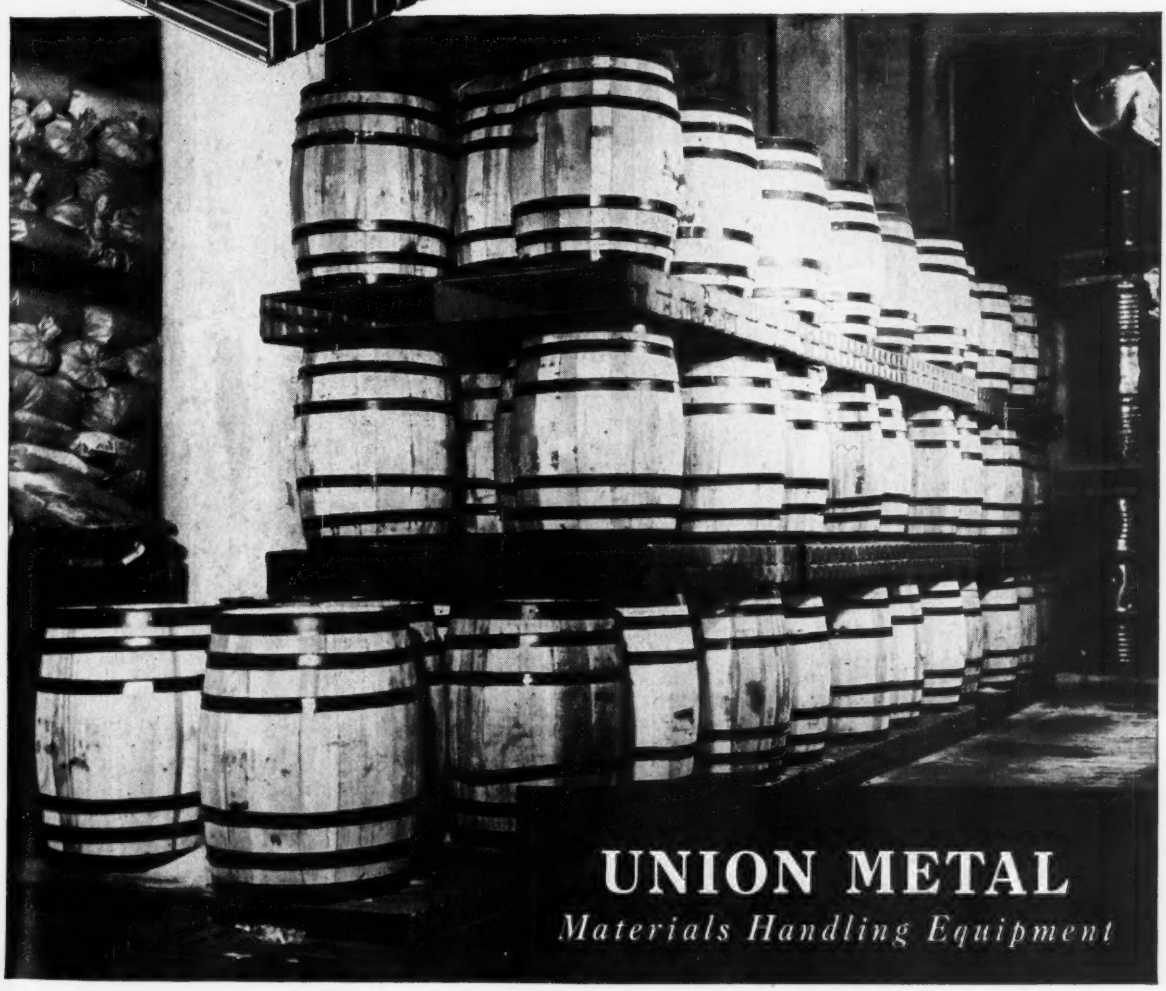
You can make every cubic foot of storage space *work* for you—keep floor space clear for stepped-up production—with the help of Union Metal's material handling equipment. These sturdy steel pallets, skids, and boxes help . . .

• SAVE TIME • SPEED PRODUCTION • CUT COSTS

. . . because they are *designed* to store or move raw materials or finished products safely in unit loads—on a time-saving, cost-saving, schedule.

Put these Union Metal units to work in *your* plant to help cut your handling costs. Standard designs to meet most requirements; "Specials" available for your "hard-job" problems. Complete information and prompt engineering service—just write The Union Metal Manufacturing Company, Canton 5, Ohio.





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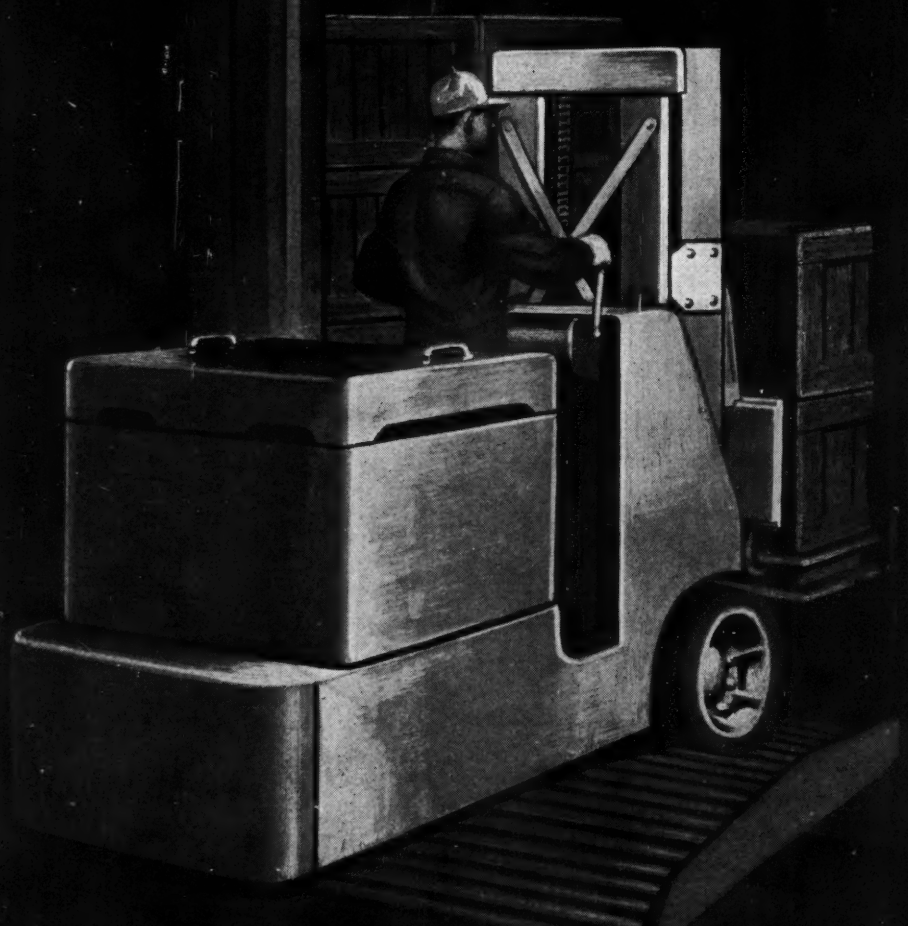

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STORAGE BATTERIES

PHILCO CORPORATION • STORAGE BATTERY DIVISION • TRENTON 7, NEW JERSEY

VOLUME 2, No. 7

APRIL, 1947

Flow

COVER PHOTO—A tongue switch transfers carrier from single to double monorail track. More than 1,600 feet of such track serve the finishing department. See the details in the article on page 36.

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In This Issue

Features

Departments

The Kind of Man Industry Needs!

A versatile expert in many fields

THE best material handling men are bound to be men who sell material handling equipment, yet hardly a week passes that we do not receive at least one, and often as high as five, letters which read pretty much as follows: "Will you please recommend some firm to us who can help us with our material handling problems but who does not sell equipment."

Of course, the reasons for letters like these are obvious. There's a feeling abroad that if an equipment man sells conveyors, his customers are going to wind up with conveyors, whether they need them or not. Or, if the equipment man happens to sell trucks, or overhead equipment, or hoists, or what not, his customers are going to wind up with that kind of equipment.

Prior to the war, the science of material handling was more wishful than real. It was the kind of thing of which the average plant executive said, "We must do something about that sometime." While the war taught industry that there are many savings to be effected by proper material handling methods, there have been no formal engineering courses in schools, and there are practically no text books on the subject. It's pretty difficult for a man to become a material handling expert without being in the equipment end of the business. Until recently, no man could make a living being a material handling engineer because industry would not pay for such talents. Men who chose material handling as their life's work had to sell equipment to live.

Certainly, no man who has held a job in a single office or plant could come into the engineering field and still be a versatile expert in many fields. It takes the sort of free-lance who one day works in the textile industry, the next in a ceramic plant, and the third in a paint plant. This is the kind of man that industry needs and wants. This kind of man can only be found among the equipment men.

The material handling industry has grown so tremendously and there is so much business for everyone, equipment salesmen do not have to sell their equipment where it does not belong. Industry *can* trust these salesmen, because they are building the material handling equipment in industry not for today, but for many years to come; and they know that if they sell the wrong kind of equipment, not only they, but their firms and the whole industry will suffer. Like every other sound business, the handling equipment salesman must build for the future. And the only way he can do that is to have properly served customers now.

Irving B. Hexter

PUBLISHER

You Can Know . . . HOW

Mr. Fell is in charge of the Cost Accounting, Payroll and Tabulating Departments and Property Accounting for The National Screw & Manufacturing Company. He is a member of the National Association of Cost Accountants and the National Office Managers Association. The cost system has been developed through the use of tabulating equipment.

By RICHARD D. FELL,
Manager Cost Accounting,
The National Screw & Manufacturing Company,
Cleveland, Ohio

COSTING SYSTEM

COST reports are divided into two categories, (1) Labor Costs, (2) Operating Costs. These statements are provided for each of the operating departments as well as for the Material Handling Department.

The labor costs are compiled by distributing the actual payroll cost to the departments charged. In the production departments the material handling cost directly chargeable to the departments is segregated through the use of an indirect labor code (See Figure 1). The costs for this code are compiled monthly on a comparative statement showing the operation costs for the current month, the year to date and also the number of employees necessary to the operation. The cost basis, which in our organization is the total operating machine hours, is the basis for the cost comparison. This basis is arrived at by dividing the payroll costs for the indirect labor code by the actual operating machine hours for the current period.

Here is how you can apply cost controls for material handling. Material handling costs are a sizeable item in nearly every manufacturing concern. There are many "hidden" costs which only come to the attention of management through the preparation of adequate cost reports. In order to establish cost reports to analyze and control the material handling costs The National Screw & Mfg. Company has inaugurated a cost system designed to emphasize inter and intra departmental handling costs.

Inter Departmental Costs

The operating cost statement (Figure 2) segregates the material handling cost which is the distributed portion of the cost of operating the Material Handling Department. The basis of distribution is according to the number of tons of material produced and handled in these departments. By adding together the indirect labor costs for material handling on the labor statement and the distributed amount of material handling from the operating statement we arrive at a total cost of handling the production on a departmental basis.

Material Handling Department

In addition to the internal departmental handling the plant operates a department charged with the responsibility of advancing material from department to department which is called the Material Handling Department. This department is responsible for the operation of the plant's three chain conveyor systems which serve some 20 departments, also for the operation of 15 electric and gasoline powered tractors and lift trucks. The monthly cost statements for this department are identical to those mentioned previously, namely the Labor and Operating Statements.

The labor statement is composed of four major classifications, (See Figure 1).

(A) Direct Labor, the operators of the trucks and tractors and conveyor attendants;

(B) Indirect Labor, supervisors (other than Foremen);

(C) Additional labor costs, consisting of incentive and overtime premium for both direct and indirect labor;

(D) Employees expense, payroll taxes, vacations, group insurance and accident compensation (workmen's).

The sum of these four classifications is the total labor cost of operating the material handling department. For purpose of analyzing, the total labor cost is divided by the tonnage (handled during the period covered by the cost figures) to show the per ton material handling labor costs.

The operating statement (Figure 2) segregates expenditures by account charged. The expenditures are classified according to variable and fixed expenses.

..ARE YOU GETTING THEM ALL?

MUCH IT COSTS

The sequence of items appearing under the category of variable expenses are as follows:

(a) Labor

The sub-totals and total of labor costs brought forward from the labor statement so that the total department cost may be summarized on one statement.

(b) Power

This represents the power cost of operating the 3 conveyor systems. It is computed on the basis of horse power rating of the electrical motors which operate the lines. Also charged to power is the current consumption required for charging the batteries of electric tractors and lift trucks.

(c) Tractor and Conveyor Maintenance

This figure included labor, overhead and material for tractor and conveyor repairs performed by the Machine Shop and other maintenance departments. The cost is computed through the use of labor tickets for work expended and factory supply requisitions issued for materials used by the maintenance departments. Individual repair costs are maintained for each of the conveyors and tractors to isolate any excessive repairs against the equipment.

(d) Utility Labor

Occasionally a special type of handling is required by the Material Handling Department in an outside area. This is done by the Utility Labor Department with its heavier equipment consisting of gasoline-pneumatic tired tractors. This is charged to the Material Handling Department and becomes a part of the cost of operation.

(e) General Factory Supplies

All supplies requisitioned from the Stock Room such as gloves, waste, etc. are charged to this heading.

(f) Material Handling

Items under this heading include idle time of the operators if equipment breaks down or the time required by a driver to pick up a skid load of screws which he spills.

The effective use of these forms is explained through frequent references in article.

FIGURE 1

MONTH OF 194	COST PER HR.	STATEMENT OF LABOR COSTS	YEAR TO DATE PER HR.	YEAR TO DATE TOTAL
	XX	TOTAL NO. OF EMPLOYEES	XX	
	XX	TOTAL DIRECT LABOR HOURS	XX	
	XX	TOTAL INDIRECT LABOR HOURS	XX	
	XX	TOTAL OPERATING MACH. HRS	XX	
		TOTAL DIRECT LABOR COST		
		INDIRECT LABOR		
		06 Set-up Men		
		06 Washers and Cleaners		
		07 Cribmen		
		09 Machinists		
		09 Rattlermen		
		10 Job Training		
		11 Supervisors		
		13 Clerks		
		14 General Laborers		
		16 Night Bosses		
		18 Inspectors		
		32 Material Handlers		
		TOTAL INDIRECT LABOR COST		
		ADDITIONAL LABOR COST		
		02 Direct Labor-Incentive		
		04 Direct Labor-Overtime Pr.		
		16 Indir. Labor-Incentive		
		17 Indir. Labor-Overtime Pr.		
		TOTAL ADDITIONAL LABOR COST		
		EMPLOYEE EXPENSES		
		70 Payroll Taxes		
		75 Vacations		
		77 Group Life Insurance		
		78 Accident Compensation		
		TOTAL EMPLOYEE EXPENSES		
		TOTAL LABOR COST		

Dept. No.
Cost Center Department

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FIGURE 2

MONTH OF 194	COST PER ___ HR.	STATEMENT OF OPERATING COSTS	YEAR TO DATE PER HR.	YEAR TO DATE TOTAL
		VARIABLE EXPENSES		
		DIRECT LABOR		
		INDIRECT LABOR		
		ADDITIONAL LABOR COST		
		EMPLOYEE EXPENSES		
		TOTAL LABOR COST		
		21 Office Supplies		
		41 Power ____ H.P.		
		42 Fuel		
		52 Defective Product		
		76 Rearrangement of Equipment		
		64 Maint.-Machinery & Equipment		
		81 Processing Material		
		82 General Factory Supplies		
		85 Tools and Dies		
		86 Perishable Hand Tools		
		422 Utility Labor		
		420 Material Handling		
		427 Inspection		
		99 Other Expenses		
		TOTAL MFG. EXPENSES		
		TOTAL VARIABLE EXPENSES		
		FIXED EXPENSES		
		931 Building Sq. Ft.		
		62 Depr. -Prod. Equip.		
		63 Depr. -Non-Prod. Equip.		
		69 Rental		
		73 Taxes and Insurance		
		411 Supervision - Foreman		
		410 Factory Administration		
		TOTAL FIXED EXPENSES		
		TOTAL VARIABLE & FIXED EXP.		
		PIECES		
COST PER M PCS				COST PER M PCS
		DIRECT LABOR		
		OTHER LABOR		
		TOTAL MFG. EXPENSES		
		TOTAL FIXED EXPENSES		
		TOTAL VARIABLE & FIXED EXP.		

Dept. No.
Cost Center Department

H S & M Co. F-336-3A

(g) Inspection
Similar to (f), if driver spills a skid load of small parts which must be taken to the Inspection Department for sorting, the Material Handling Department is charged for the inspection time. Excessive charges under (f) and (g) indicate inefficiency.

The total manufacturing expenses plus the labor cost represent the total variable expenses.

The second group of operating expenses is classified as Fixed Expenses. These expenses appear under the headings as follows:

(a) Building Expenses
The number of square feet of floor space occupied by the conveyors is charged at a cost rate per square foot.

(b) Depreciation of Equipment
This is figured by dividing the original or reproduction cost of the equipment, whichever is greater, by the normal life span and dividing the remainder by 12 to arrive at the monthly depreciation amount.

(c) Taxes and Insurance
Property taxes and insurance on the equipment. Again the original or reproduction cost, whichever is greater, is used to arrive at this expense.

(d) Supervision
The foreman's salary is classified as a fixed expense because it is not subject to the fluctuation of the department activity as is the balance of the labor costs.

(e) Factory Administration
This charge is based on the cost of operating the Payroll, Cost, Personnel Departments and the Superintendent and his staff. This cost is distributed to the Material Handling Department on the basis of the number of manhours in the department.

The total fixed expenses plus the total variable expenses represent the total cost of operating the department for one month. The tonnage handled for the entire plant is listed on the following line. In the last section of the statement a per ton cost is figured for (1) direct labor, (2) other labor costs, (3) manufacturing expenses, (4) fixed expenses and (5) total variable and fixed expenses.

Three comparisons are available to Management from the cost statements for an analysis of handling costs. The first is the standard cost or the amount which it should cost for material handling based on normal operation. The second is the current month actual costs which can be compared with the standard costs to denote the variances, and the third is a year to date cumulative summary for the fiscal year which is shown on the right half of the monthly statement. The year to date figure also shows the avérage cost per machine hour per month which can also be compared with the current month and the standard sheet to emphasize any one or more charges that vary excessively from the standard costs.

Cost Analysis Application

The information shown on these statements furnishes management with an accurate picture of material handling, as well as the cost of operating the departments. These costs are segregated by cost center as well as departments and with this fine break-down the possibilities of control are unlimited.

Sheet Grab and Two-Way Hoist

PLANNING for maximum utilization of space and equipment lies behind this application. A special grab mechanism and a skillful track arrangement provide savings in aisle space and maximum use of head room.

The hoist carriage has two directional motion and the grab is designed to

lift sheet steel of various widths to a maximum height. Note that the transverse I-beam rail is not hung from but is recessed to ride between the longitudinal I-beam rails.

The grab is made up of a center member and two pick up elements. The center member is attached to the hoist cable by means of a removable pin and is flanged with plates at both ends. Pick up elements consist of an angle, approximately equal in length to the sheet steel, and two arms secured to the angle extremities. The arms are bowed out to permit sheet clearance and are pivoted to opposing ends of the flanges in such a manner to provide a tong mechanism. Spacers between bundles make it easy to engage the tongs.

Utilization of this two-way hoist with the grab attachment permits one man efficiently to handle a vast quantity of materials. It will be noted that this arrangement requires a minimum of aisle space as materials are moved overhead.

***In addition to the warehousing and handling of steel sheet, other fields of usefulness include stacking fabricated materials, castings, lumber, crated goods, and other large flat articles.*—Courtesy, The Yale & Towne Manufacturing Co., Philadelphia Division.**

Announcing the 1ST

Flow CONTEST

$1500.00 IN CASH PRIZES

For the Best Papers on Cost Reduction Through the Use of MATERIAL HANDLING EQUIPMENT

Management is becoming more and more material handling conscious—for it is in this field only that American Industry and Commerce can anticipate great savings, lower unit costs, more utilization of floor space, reduced shipping and warehousing expense. The cold actual facts are essential to management. To center interest in this broad subject FLOW Magazine announces its first "Cost Facts" contest. This contest opens March 15, closes December 15, 1947. Papers may be submitted describing any type of installation, old or new, big or small, in which the installation of material handling equipment can be demonstratively proven to have saved money. Papers submitted (they may be of any length) will be judged on (1) the exhaustive analysis of the cost factors entering into the installation or installations described, with details of the methods used in measuring cost savings, (2) the evaluation of the efficiency of the present methods over the past methods, and (3) the technical accuracy and completeness of the entry. Pictures, charts and layout drawings are necessary to the cost analysis presentation. This is to be an annual feature of FLOW Magazine. The first $1500 cash prize contest is open—get rules and entry blank—today.

Awards . . . . **1st PRIZE $500.00**

2nd PRIZE $300.00 • 3rd PRIZE $200.00

4th • 5th • 6th • 7th and 8th Prizes $100.00 EACH

RECEIVING

In your paper you may choose to describe your receiving room and yard practices in which there may have been significant percentages of savings when specialized mechanical handling equipment was used. A description of the cost reduction results with the necessary supporting evidence may win prize money.

PROCESSING ASSEMBLY FABRICATION

Plant material handling improvements may have been made:—How and where has the use of equipment affected the cost of departmental overall operations, unit prices, or efficiency? Did a rearranged plant layout affect this? What are the facts? All the departmental cost facts of your "internal freight" mechanical handling can make a paper which will win you money.

PACKAGING MECHANICS

Many firms have saved huge amounts of money by proper packaging methods. These are, in the final analysis, material handling methods. Analyze the packaging handling. You may want to select this phase of your experience for your prize winning paper.

WAREHOUSING OR STOCK KEEPING

You may have done a job of reorganization of space or scheduling which involved "putting it on wheels" and "up in the air." When you did, what and where did you save? Possibly your paper on this problem would be one of the big prize winners!

The $1500 award contest is open to everyone except a manufacturer or sales representative of what is generally known as material handling equipment. First prize is $500; second prize $300; third prize $200 and there are five prizes of $100 each. Writing ability is not important!—the completeness of your facts is.

Because of the confidential nature of many cost figures, we will not publish (when specifically requested) entrants' names or names of companies where cost studies originated. If actual figures cannot be used, the study may be expressed in percentages.

SEND FOR YOUR ENTRY BLANK

Now!

Write

CONTEST EDITOR

Flow MAGAZINE

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CLEVELAND 13, OHIO

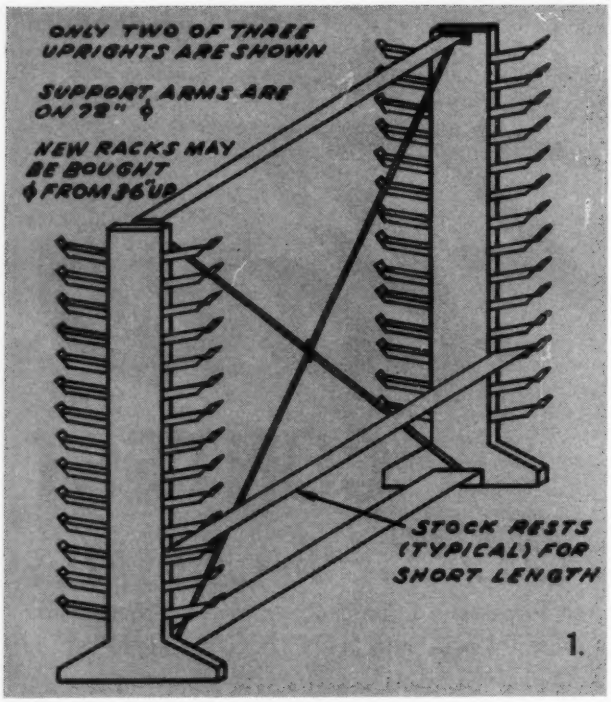


Fig. 1. **Bar and Rod Rack; Hoist Service.**

1. Commercially available as shown or with added sections. May have less stock-support arms, may be single-face, may be varied in length of support center-to-center distance.

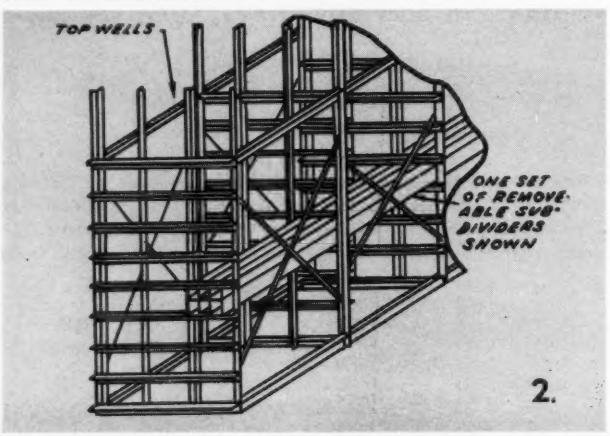


Fig. 2. **Pigeon-Hole Rack, with or without sub-dividers for small diameter stock.**

2. Is available to order from some fabricating firms, or may be built. All uprights to be 1½" x 1½" x 3/16" angles; top and bottom stockrests, also front-to-back tie members to be 2" x 2" x 3/16" angles; all other stock-rests to be 1" x 1" x ⅛" angles; x-members to be 1" x 1" x ⅛" strap. Height, width and depth are regulated by size and number of openings. Stock overhang of 6" at front and 12" at rear is good practice with small diameter stock; up to 24" at rear is also acceptable on larger diameters.

in a miscellaneous st

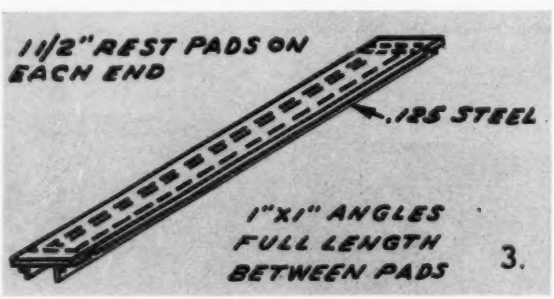
Where t

And the approach to the solution is: 1. Find the "dead horse" items. 2. Determine how much material of each items is actually required. 3. Design suitable storage and handling facilities according to product and turnover rate. These steps lead to effective practice and stock control.

IF YOU have a miscellaneous storeroom, the chances are you also have a problem child in the plant. These places, like Topsy, "jes growed", and are generally as unpredictable and uncontrollable. Sometimes a reasonably satisfactory operation is developed by a storekeeper with a special gift for the job. But it's a problem when he's off sick or away on a trip. If you have miscellaneous storeroom trouble, maybe this article will be of some help. We have just learned of such a situation—and it was a jumbled mess!—which was straight-

Fig. 3. **Removable Stock Rest for use with rack #1.**

3. A variation of this shelf is commercially available for lighter weight material. If made locally, use S.A.E. #1010 (or close) sheet .125" thick and 1" x 1" x ⅛" angles.



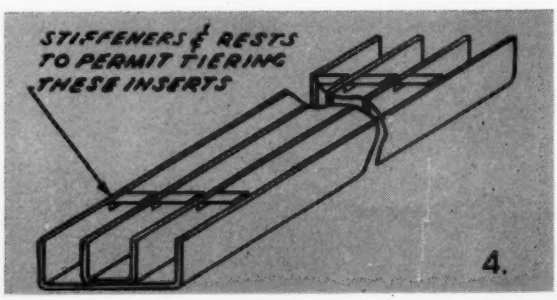


Fig. 4. **Sub-Dividing Insert for Pigeon-Hole Racks.**

4. Construction shown permits forming a press-break from .063 thick sheet steel. Assemble by tack welds spaced at 12".

storeroom the constant problem is

to Put Everything!

ened out by the use of simple analysis and common sense.

"What Was Actually Required?"

The problem was the storeroom in a new and specialized department of a large corporation. After several months of operations, materials were scattered around, within and without the fenced enclosure, like hay tossed in the wind. Supervision was crying for more room; Accounting and Production were getting tough about control. Then an engineer with materials handling and storage experience was assigned to get the facts. After two days of surveying and probing he decided that the remedy was in providing tailor-made and accessible storage for each item of material actually required.

Sounds trite, doesn't it? It took him two days to find out what everybody knew was needed in the first place. The joker was in the two words "actually required." Between large lots of "cushion" (material ordered in excess of requirements to allow for scrap, changes, etc.) and lack of "history", nobody knew what should be in the storeroom, let alone how to control it. But, try as he might, at first he couldn't develop a list of necessary items. So he decided to straighten up the room first. Once the storekeeper could get at what he wanted without moving a dozen or two of items, once he could "spot" his unidentified and "dead horse" items and press for their disposition, then sound controls could be installed.

The engineer then went through the back door—from a corporate viewpoint. That is, he forgot about specifications, drawings, items and styles. Instead, he broke his problem down into sizes, shapes, characteristics and quantities. He reasoned, and confirmed with departmental personnel, that usable stock on hand was representative of the type material and the quantity of each required at any one time in

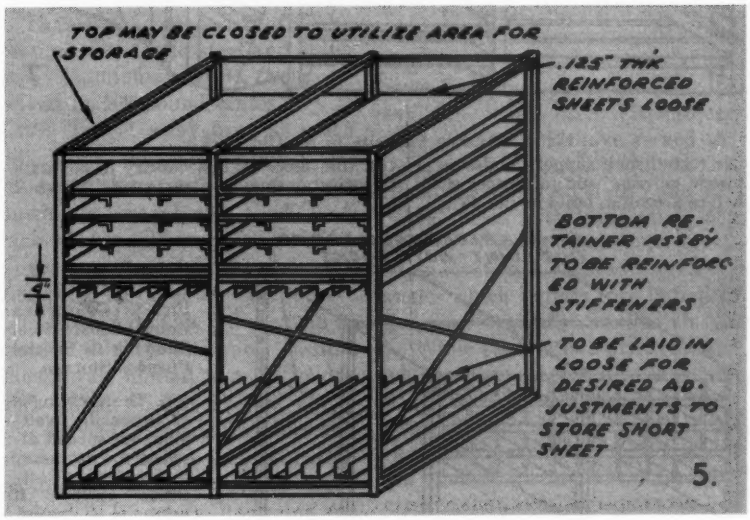


Fig. 5. **Sheet Stock Rack.**

5. Can be built by any fabricator. Uprights to be of 1½" x 1½" x 3/16" angle; top center to be U-channel or its equivalent formed from two angles 1½" x ½" x ⅛". Base, top-tie and center-tie members to be 2" x 2" x 3/16" angles. Shelf carrier angles to be 1½" x 1½" x 3/16", shelves to be .125 thick steel reinforced with two each of 3" x 1" x ⅛" angles, longer leg secured to shelf with 1" fillett weld per 9" of length.

Form stock retainers as per details of (4). Bolt top-retainers securely to center tie-members (2" x 2" x 3/16" angles), including middle member not shown in sketch. Base angles are to include 2 members front to rear for each of two openings shown, equally spaced. Lay bottom stock-retainer assembly in loose. Where 36" or other width sheets are stored on end, build a support frame as per the base, install at a point 12" higher on the uprights and lay bottom retainer on it. The space vacated can can be recovered for storage of flat sheets by laying on .063 thick sheet over the base angles.

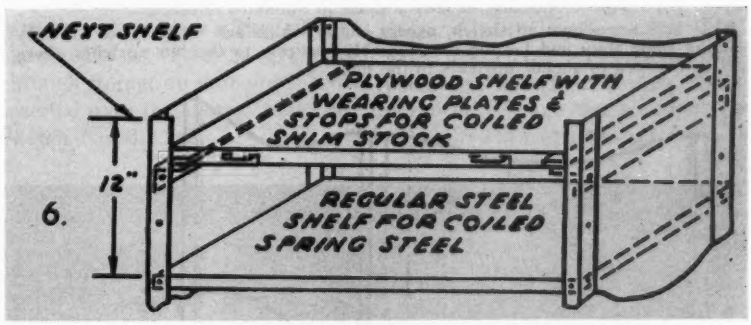


Fig. 6. **Pull-Out Shelf (protects "easily damaged" items).**

6. Light-weight, perforated shelves, including shelf-slide assemblies are available from most bin companies. If you cannot locate the manufacturer of your bins:

1. Bolt angles as shown, angles to extend about ¾" inward from the bin uprights.

Example: If bin uprights are 1½" angle, use 2½" angle for shelf rests. Use ½" or ¾" plywood, depending on material stored. Form a 1½" wide flange on a piece of 16 or 18 gauge steel which is the width of the shelf and ¼" higher than the distance from top of shelf to bottom of the next higher shelf flange. This strip acts as a stock retainer and also as a stop when pulling out. Insert wear plates on shelf as shown. Make from 1" x 1" x 1/16" steel. Bolt (or rivet) back-stop, handles and wear plates thru the thickness of the shelf. (Will not hold if screwed in ends).

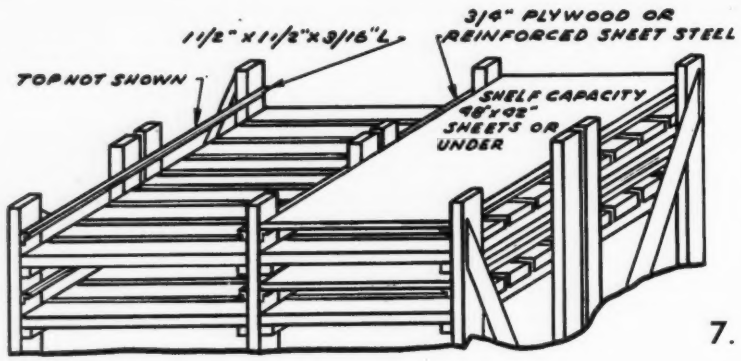


Fig. 7. Adding Capacity to An Old Rack.

7. Install shelf support angles as per (6). One-piece shelf necessary to facilitate storage or issue, and to protect stock. Capacity as shown is up to 800#. If steel shelves are used, build as per (5).

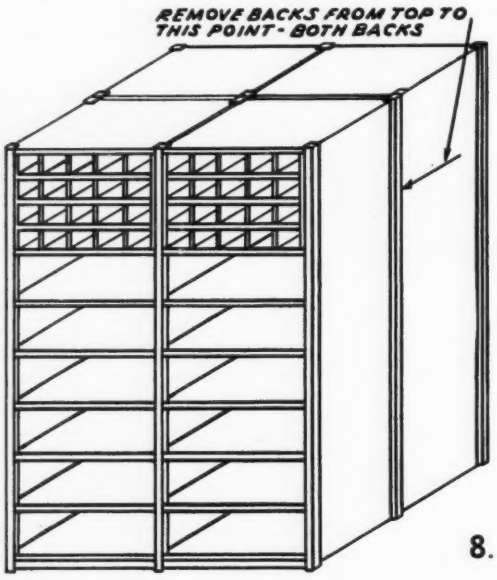
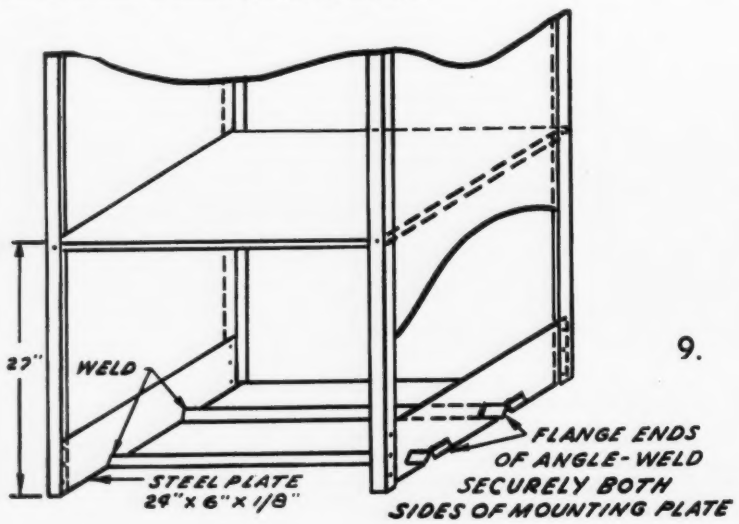


Fig. 8. Converting Conventional Steel Shelving to Special Purpose Storage.

8. The shelving is commercially available, but special dividers are necessary to form the "Post-Office" Insert. If built from wood, use 3/8" plywood for three shelves and both sides. Make vertical separators from 1/4" plywood. Rout shelves slightly to position dividers; glue together. (If seasoned wood is available, that, also, is satisfactory material).

Fig. 9. Fixture for Heavy Reels in Standard Shelving.

9. Details are shown on sketch, except angles which are 3/4" x 3/4" x 3/16". By welding completely and bolting the assembly securely to the bin uprights, there will be no need to anchor uprights to the floor.



the next few months. To these figures was added about 30 percent of each amount, to cover reserve and growth. Following are the classifications and solutions that were devised for the different items.

Putting Things Where They Belong

Rod, Bar, Tubing, Sections (Metallic)

The great majority of items were round rods, and bars, both steel and brass, with a few copper sections and a scattering of square, hex, and rectangular sizes. All items were long and relatively slender, and most of them were in small lots (from one to two bars up). Only a few were tonnage items—from 3,000 to 10,000 pounds each. These were broken down as follows.

For manual handling, both storage and issue: Material up to 1.375 dia. and all thin-wall tubing. *For power hoist storage, manual issue:* Large lots of diameters under 1.375. *Power hoist handling, both storage and issue:* All sizes over 1.375 diameter, including thick-wall tubing. The weight breakline was approximately 60 pounds, considering storage to a height of 66".

Three bar racks that were in use, with all stock rests installed, yielded 84 storage areas for sizes to 2.875 diameter or shape, as shown in Sketch No. 1. With stock rests on 70" centers, lengths less than that could not be stored. Diameters under .500" sagged and tangled, and items were mixed. A pigeon-hole rack was first provided for stock of diameters under .500". This was of conventional design (Sketch No. 2) except that the openings were further subdivided with full-length separators which adequately supported the material and yielded many more storage spaces for the same floor area. Each opening approximated 3 3/4" × 3 3/4" and held approximately 350 pounds. (Sketch No. 4.) If the number of items were reduced and poundage increased, removal of the inserts left an opening 12" × 8" × 120", holding about 2,000 pounds.

Next was provided another pigeon-hole rack of standard design with openings 6" × 6", each of about 900 pounds capacity. Since most of the items in sizes from 1.375 down to .500 were drawn from Main Stores in small lots, this

type of storage proved suitable. Further, these openings could be lined at will to accommodate items of small diameter. With the manually handled items thus disposed of, consideration was next given to the last sub-division.

The three bar racks could be serviced by an overhead hoist and grab assembly if reasonable care were exercised. Accordingly, an electric hoist and monorail were provided to pass over the rack centers. To store items shorter than 70″, rest plates were made, which are shown in Sketch No. 3. There were few enough items over 2.875 diameter to permit these larger sizes to be nested between the rack bases. The latter were still accessible to the hoist when they were rolled into the access aisles. Large lots were a problem until the idea was conceived to install "wells" at the top of both pigeon-hole racks. This proved to be a practical solution. Thus over 250 items could be stored, with a weight total exceeding 175,000 pounds.

Strip (Metallic)

This remained in wooden boxes for protection. The loaded weight of these boxes was from 250 to 550 pounds and they were well scattered. A maximum size of 12″ × 72″ was selected and a rack provided, each opening of which would hold the contents of one box of strip. This rack (similar to Sketch No. 2) was lined to keep the strip straight and unmarked.

Unopened boxes were stored under the monorail. Copper sections remained in the wooden shipping boxes from which one end was removed. They were tiered. The few pieces issued at one time were drawn out as required. Since their weight was small, this type of storage utilized overhead space to good advantage, making available additional floor area.

Metallic Sheets

These were preponderantly aluminum, with some steel and stainless. Aluminum sheets were received in 500-pound crates 48″ × 144″. To get away from as much difficulty as possible, the policy was set up to shear such material to a maximum size of 48″ × 60″. A rack was then designed (Sketch No. 5) to store sheets on end that were .063 thick and greater. These were thus easily available for one man to handle. Lighter and more flexible sheets were limited to a 36″ width and stored on flat shelves above the "on end" items. All shelves and stock retainers were loose or bolted so that adjustment could be made if needed for more items, or for smaller widths in "on end" storage.

Coiled Sheet and Strip (Metallic)

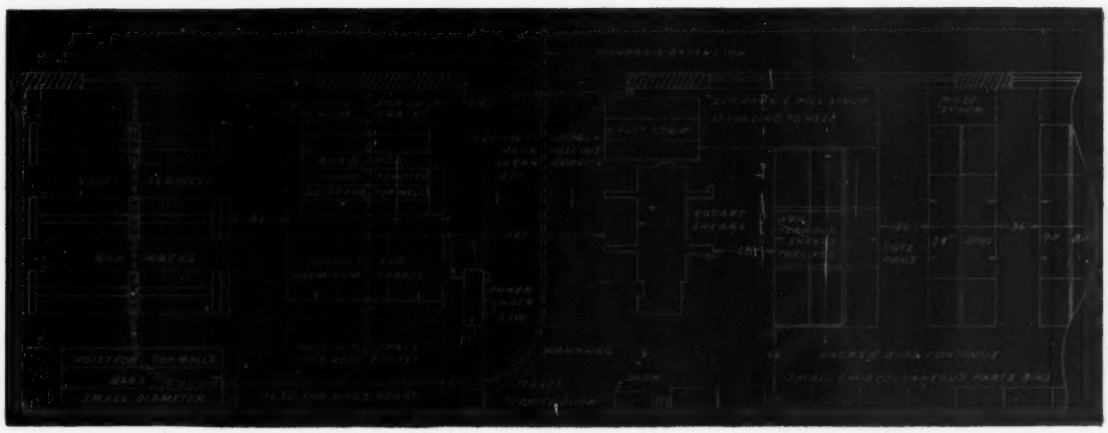
Material of this type consisted of a few coils of brass strap and quite a few rolls of spring steel and brass shim stock. Standard bin openings of 36″ × 24″ × 12″ proved to be best suited, with brass coils at the bottom. Many of the rolls were only 8″ high. Adequate protection was given expensive spring steel in the smaller sizes (.020 × .125, etc.) through storage on slide-out shelves inserted over the shorter rolls. See Sketch No. 6.

Non-Metallic Sheets, Tubes, Rods

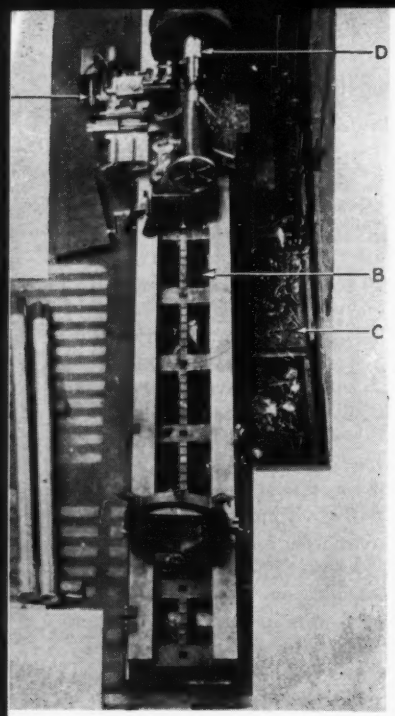
The sheets of bakelite, mica, etc., covered a broad range. To avoid distortion, marring and separation at the edges, even heavy thicknesses were stored flat. A wooden rack, built from two-by-fours and two-by-sixes (a wartime expedient) was still in service. Since the shelves were 42″ wide, spaced a net of 9″ vertically, it was easy to gain added capacity by inserting extra shelves. Since ¾″ plywood happened to be available, it was used. (Reinforced steel sheets would have served the purpose as well.) It required this thickness of plywood to span 42″ × 48″ areas with loads up to 600 pounds. The plywood shelves rested, unattached, on 1½″ × 1½″ angles which were in turn bolted to the wood uprights. See Sketch No. 7. While some waste area resulted when storing sheets less than 42″ wide and 48″ long, the net result was doubled capacity for the variety and quantities of this material on hand. (This allowed for even greater than normal expansion.)

The nonmetallic tubes and rods differed from the metallic ones in size and weight. The maximum length was 48″, and most diameters were up to 1½″; the weight was only a pound or so per piece. Again storage height over a comfortable range for heavier items was utilized. One of the conventional racks, 24″ deep per side and back to back, yielded 48″ straight through storage when the back was removed from between the top shelf areas. Into this a "post office box" with 6″ × 6″ pigeon-holes was placed, as shown in Sketch 8. It permitted storage of a wide variety

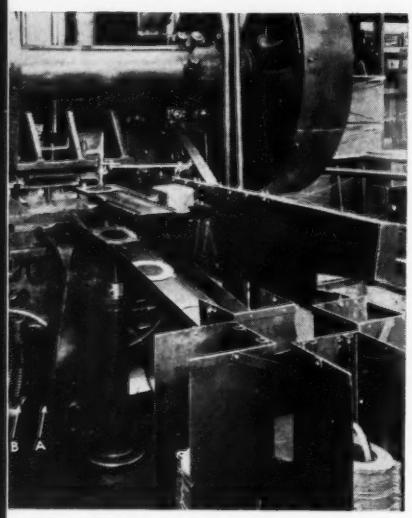
(Turn to page 58)



Handling Salvage



Large lathe (A) with incline (B) built in foundation to direct chips from shaft (D) to pit.



Bulk scrap travels box-chute (A) to conveyor; Scrap stamped thru die goes down thru pipe (B).

HIGH speed automatic production machines can generate a great amount of heavy scrap in an extremely short length of time. This scrap, whether ferrous or non-ferrous, is largely reclaimable, but usually involves a number of costly operations in moving it from the point of origin to the final furnace melting process. In fact, in many instances, more operations are required than in the manufacture of a new product.

Consideration of good material handling methods in all of these operations is therefore essential if any salvage program is to be really worthwhile. First in any series of salvage operations is one that is most commonly overlooked, that of retrieving the scrap from the machine and taking it to a place where it can be adequately handled. This one process can be the cause of a great hindrance in machine output.

A large midwest electric motor and generator plant solved this problem in several ways, varying the methods according to type of production installation. Resulting reduced costs ranged from $5.00 to $9.00 per ton.

Incline Built in Foundation

In one department, where many large shafts are turned, it was found necessary to clean the chips from the machine as quickly as possible in order to keep them from piling up. Photo No. 1 shows one of the large turning lathes (A) that has an incline (B) built in the foundation which directs the chips to a pit (C) in the back of the machine. The chips, dropping from the shaft (D), hit the incline and are directed into boxes located in the pits. This incline saves considerable time in that the machine does not have to be stopped in order to remove the chips. It also eliminates the necessity of a helper to pull out the chips. Filled chip boxes are lifted from the pit by overhead crane and dumped into a larger box which is transported directly to side board scrap car by fork truck.

This arangement for chip removal is very economical because of its low investment and maintenance cost. In future installations, even larger chip boxes will be designed for the lathe pits so as to allow economical handling of pit boxes direct to the scrap car.

Conveyorized Scrap Handling

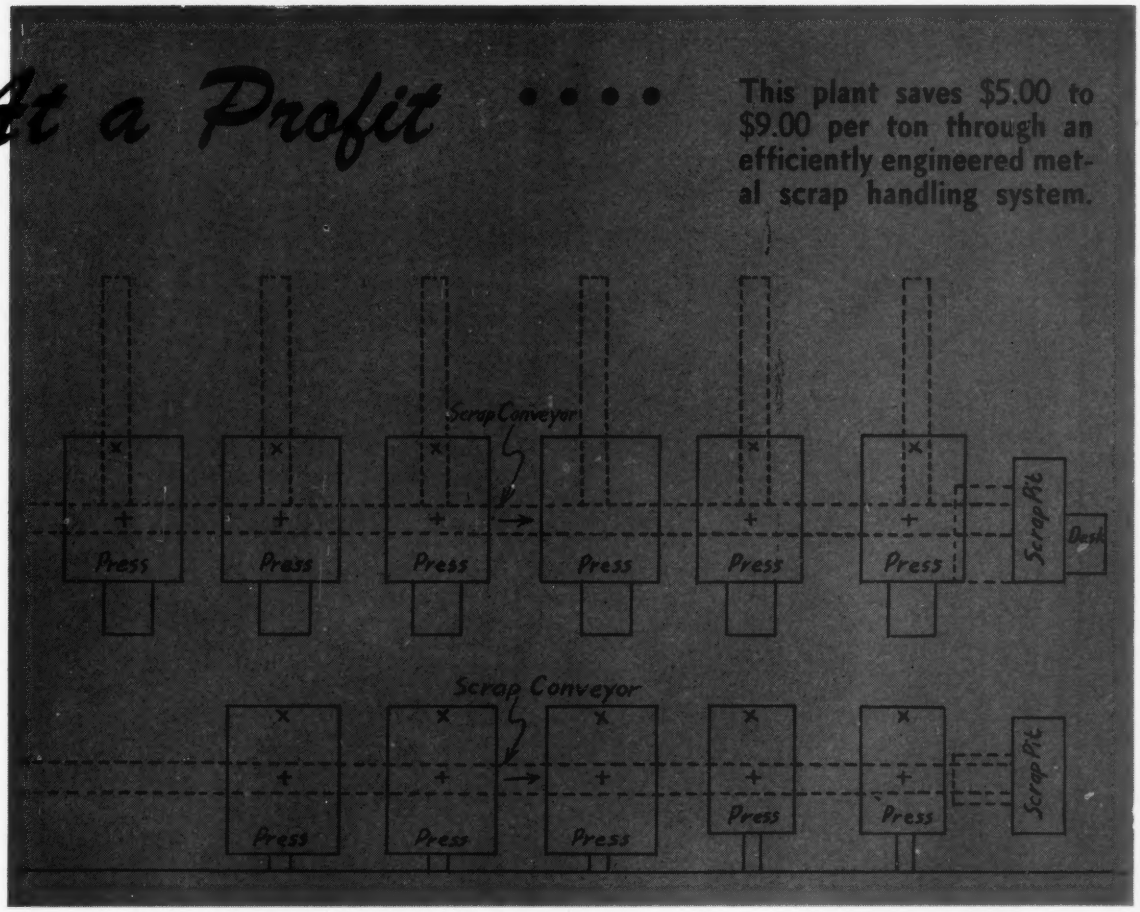
In the punch press department a sub-floor level, continuous conveyor belt is used to carry away the scrap. When the stamping is removed from the die by an extractor, the salvage scrap metal is diverted to a box-type chute, which directs it to the conveyor belt, while the scrap passing down through the die is concentrated into flexible pipe chutes and thence to the conveyor. Scrap is carried to a pit and dropped into a corrugated box, which when filled is removed from the pit by crane and placed on a trailer for removal to the scrap department. Thus a substantial saving is effected by making it unnecessary to handle scrap at each individual machine.

Another conveyor application has been made in the automatic screw machine department, where each of the huge machines is equipped with a built-in conveyor belt to remove the large number of chips falling from the cutting heads. The work pieces are diverted from the chips through the use of chutes placed directly under the cut-off position. The hot chips are directed to the conveyor by means of steel aprons bolted to brackets on the conveyor frame.

The conveyor consists of a flexible woven wire belt, 18″ wide, carried between two strands of detachable chains. Equipped with a ¼ H.P. motor and a reducer, the belt travels 35 feet per minute horizontally through tunnels in the base of the machine, then inclined upwards, it delivers the chips over the end into a centrifugal separator bucket. The filled bucket is transported directly to the centrifugal separator. Steel wire brushes located under the head sprocket, prevent chips from being carried

At a Profit . . . .

This plant saves $5.00 to $9.00 per ton through an efficiently engineered metal scrap handling system.



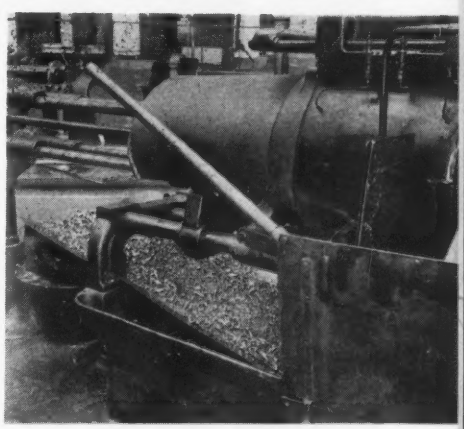
Layout shows presses, scrap-conveyor belts and scrap pits.

back into base on return run. Conveyors can start or stop with the machines or independent of them, and have resulted in lower chip removal cost, reduced oil waste, by more thorough chip drainage, and an increase in output because the machines need not be stopped to take out chips.

Paddle-Type Chip Remover

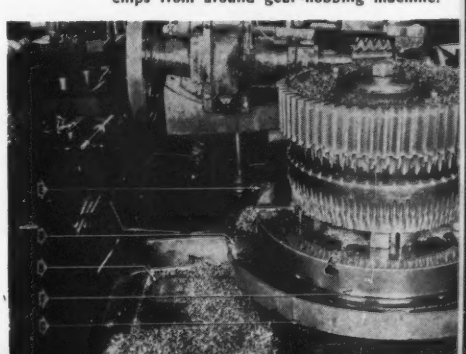
A unique system is employed for the removal of chips from vertical hobbing machines, where a tendency for chips to pile up rapidly necessitates a constant removal system. A wiper or paddle (E) is attached to the side of the revolving work table (F). As it revolves, the paddle continuously wipes the falling chips and oil from the circular pan (C) fastened around the table to catch the chips falling from the cutting head. A small opening in the pan (D) is located directly over a steel chip box (A) with a perforated bottom (B) which catches the chips and oil as the paddle passes over the hole, and allows the oil to return to the machine. When the box becomes full, it is easily removed without interfering with the machine operation. This method has reduced the loss and spoilage of cutting oil, and the clogging and injury to bearing surfaces, as well as eliminating unnecessary chip handling and shutdown time required for chip removal.

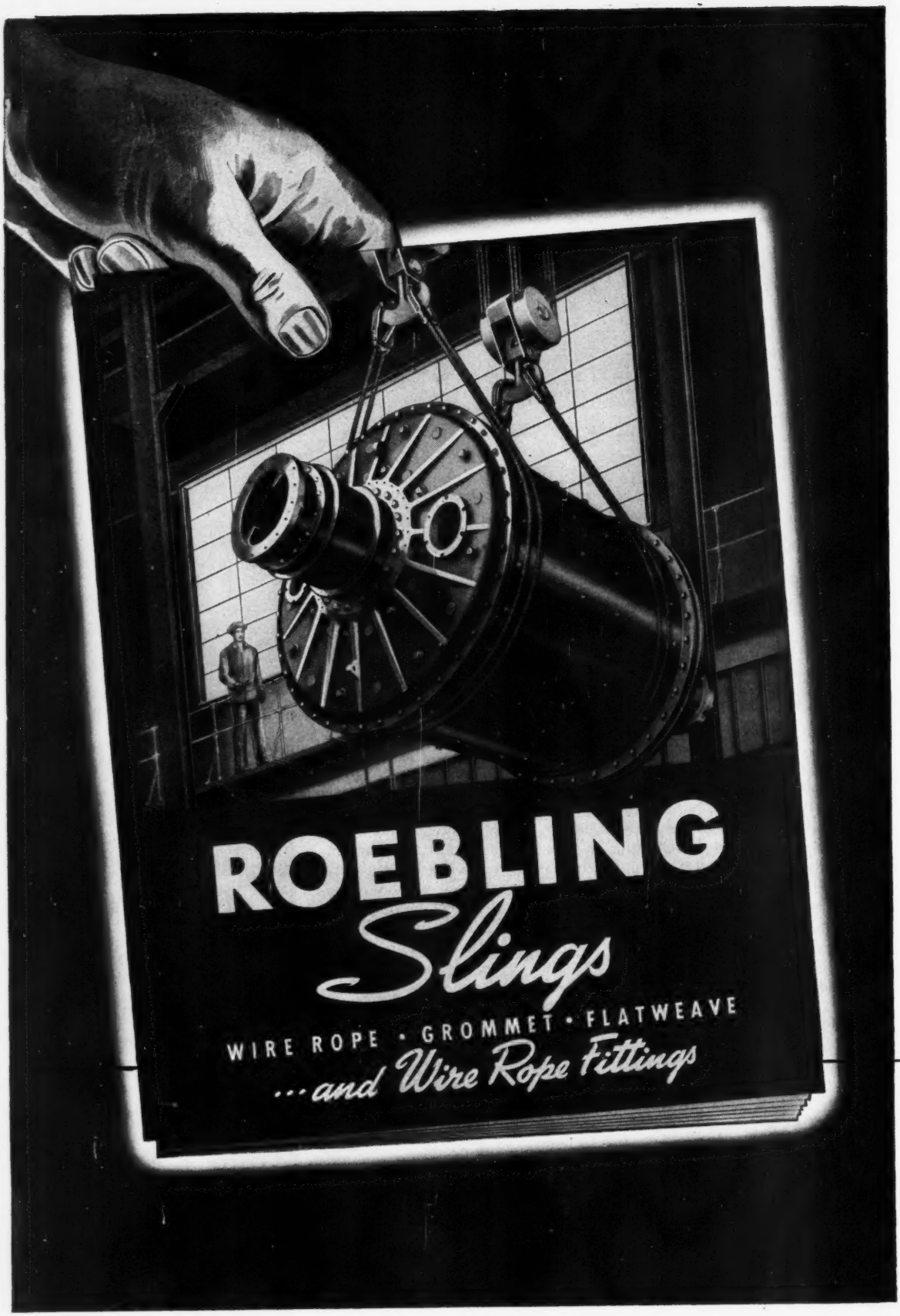
In this midwest plant three factors were considered important in planning efficient, profitable scrap handling: 1. Size of the plant. 2. Volume of scrap to be handled. 3. Regularity with which scrap is generated. So, with these points in mind during the planning period scrap-handling methods were installed that have pointed the way to higher profits through greater production and reduced salvage costs.



Automatic screw machine's conveyor removes chips falling from cutting heads.

Paddle or wiper-type chip remover cleans chips from around gear-hobbing machine.

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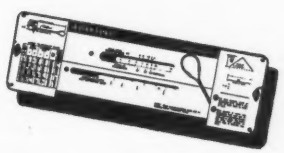

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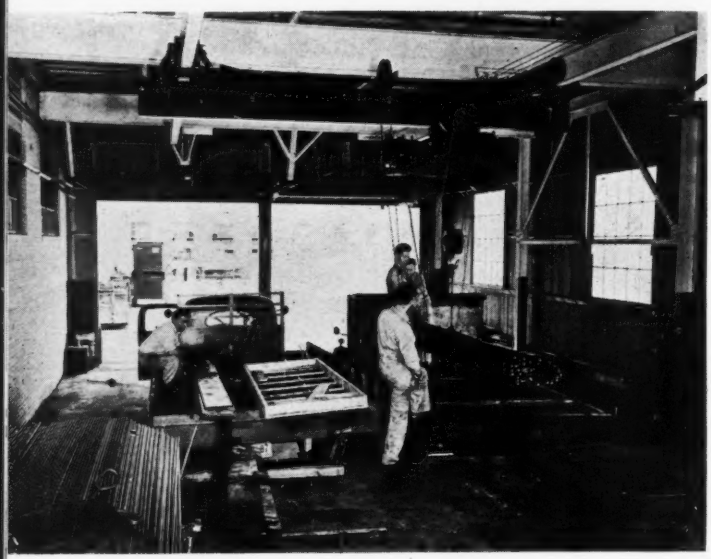
A 4-Point BAR STOCK RECEIVING OPERATION



Bar stock being removed from delivery truck to hand truck with bridge hoist and cable sling.

1 space for long lengths
2 flexible hoisting devices
3 suitable nomenclature
4 inventory system

Results: 1. Stacking is comparatively simple. 2. Flow to production is easily maintained. 3. A fatigue-free working group. 4. Efficient control.

THE handling of bar stock from the time it arrives at the unloading platform until it is placed into production often presents a series of problems which may or may not be solved. Among these are: 1. Adequate space to move the long mill lengths from the truck or railroad car to the storage racks. 2. Flexible hoisting devices which can be used to transfer the material to a suitable plant truck, or to the racks. 3. Suitable nomenclature to aid in differentiating one specification from several others. 4. A simple but effective perpetual inventory system .This is important.

Hoists Are Popular

Jack & Heintz Precision Industries Inc., Cleveland, has a dual receiving arrangement which permits handling of bar stock at the company's No. 5 and No. 6 plants either from over-the-road trucks or railroad cars. The railroad siding is strategically placed so that it is accessible from both sides, for each plant's use. The truck wells are positioned to eliminate congestion and overlapping of operations from the two plants. Referring to the

Stock brought into storage on hand truck. Note overhead hoist rails and marking.

◀ Closeup showing bent iron stock retainers on hand truck which are raised above the bed to permit quick removal of sling. This clearance also permits fork truck handling.

▶ Fork truck used in conjunction with rack loading of steel bar stock provides steady support.

flow diagram, the unloading area at (A) is equipped with a bridge hoist which extends well towards the far end of the dock providing hoisting facilities for a full truck length.

On arrival the bar stock is lifted by sling and hoist to the dock and placed on a hand truck fitted with two upturned U-shaped bar retainers. These bars are raised above the bed of the truck on two 2" x 4" blocks, which permits removal of the loads by fork truck later on. The loaded hand truck is moved to the steel raw stock storage room where the unloading is performed in two ways, to be described presently.

Before the newly arrived stock is stored, however, standard practice requires that samples be cut from several of the bars from each mill run as unloaded. These are taken immediately to the metallurgical laboratory where a complete analysis is run to determine whether the material meets specifications. In this way a complete reloading operation of an entire shipment is eliminated, should the specifications be other than those ordered. If the material is acceptable, the unloading proceeds on schedule; otherwise the stock is rejected promptly.

The area at (C) is laid out with a broad central aisle flanked on either side by heavy angle iron storage racks. Another bridge hoist runs the length of the room, while an auxiliary monorail hoist can be switched into the system to aid in handling awkward loads. Incidentally, this type of hoist is also used at (A) for the same purpose.

Value of Hand Trucks

The hand trucks carrying the bars are wheeled into this room to a position which has been allocated to the stock specification carried. The use of a hand truck is interesting here, inasmuch as powered trucks are in evidence throughout the manufacturing area. The manipulation of a hand truck loaded with long rods or tubing is comparatively simple. Another factor is the ease with which a load can be balanced on this type of truck. Having two swivel wheels at one end, the equipment can be steered through passageways by one operator, and sharp turns can be made

without upsetting the load.

As mentioned previously, two very practical methods can be used in the bar stock storage room to load the material, from or to the hand trucks. One is by use of the bridge hoist and sling method alone without any other handling device. This works well enough where light stock is being handled since binding of the bundle is slight, but when positioning bars weighing from 50 to several hundred pounds apiece, handling becomes rather awkward.

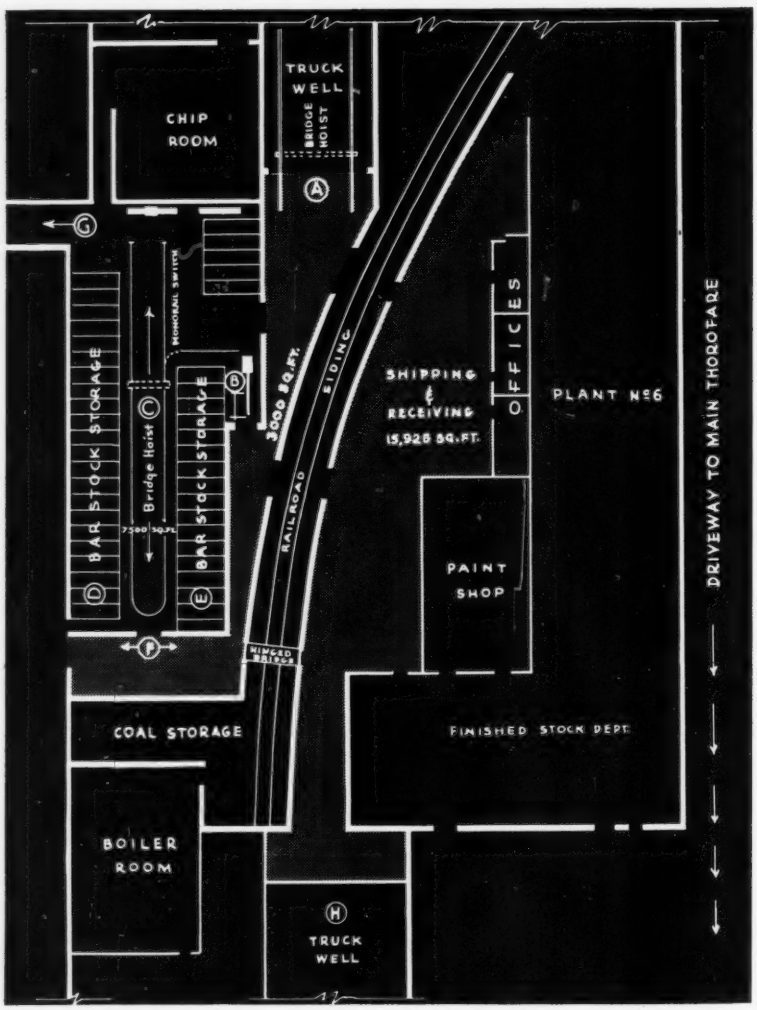
The second method shown in one of the photos is quite effective. After the hand truck brings the load to position, the fork of a lift truck is inserted between the floor of the truck and the underside of the bar stock. Hoisting the load to the desired rack height, the handlers slide the stock into position while the material lies on the forks, level with the rack.

In cases where bars several inches in diameter are to be removed one at a time, the bridge hoist can be used quite effectively in removing the stock from the pile and also in lowering it to the floor.

What About Nomenclature and Inventory?

These two factors in the handling of bar stock are sometimes so poorly administered that the excellent material handling devices employed in a plant cannot make up for the loss both in time and material despite the fact they are used correctly. This is not the case at Jack & Heintz. When bar stock, flat stock, or wire is received into the plant the receiving department checks the material in and stores it in the proper locations, at the same time sending a raw stock "in-report" to the scheduling department.

Flow diagram shows stock room in relation to adjacent departments.



When parts are required for forecasted production schedules, an order is issued to the shop for a definite amount of pieces showing the due date on which finished pieces are to be placed in stock. Attached to this order is a raw stock "out-order" which moves the material required to the department performing the first operation.

With the basic stock records being established from the annual inventory and raw stock in's and out's recorded, accurate stock balances are maintained at all times.

The nomenclature system used by the company makes the raw stock storage section a "rainbow room" because of the mass of color that strikes the eye upon entering. To a novice all of this would be just an attractive arrangement, but each color tells the stock handlers exactly just which S.A.E. specification rests in a particular rack. The specifications and colors applied are as follows:

Carbon Steels	
1010	**Green - brown cross**
1015	**Green - brown**
1020	**Green**
1025	**Green - white cross**
1035	**Green - yellow**
1040	**Green - orange**
1060	**Green - blue**
1095	**Green - black**
Free Cutting Steels	
1112	**White - brown**
1118 (XI315)	**White**
1132 (XI330)	**White - black**
1137 (XI335)	**White - blue**
Nickel Steels	
2315	**Blue - yellow**
2330	**Blue**
2340	**Blue - gray**
2345	**Blue - orange**
Nickel Chromium	
3120	**Red - yellow**
3130	**Red - green**
3135	**Red - black**
3140	**Red - brown**
3312	**Red - blue**
Aluminum	
17S-T	**Blue - yellow line**
24S-T	**Blue - green line**
17S-O	**Blue - orange line**
24S-O	**Blue - red line**

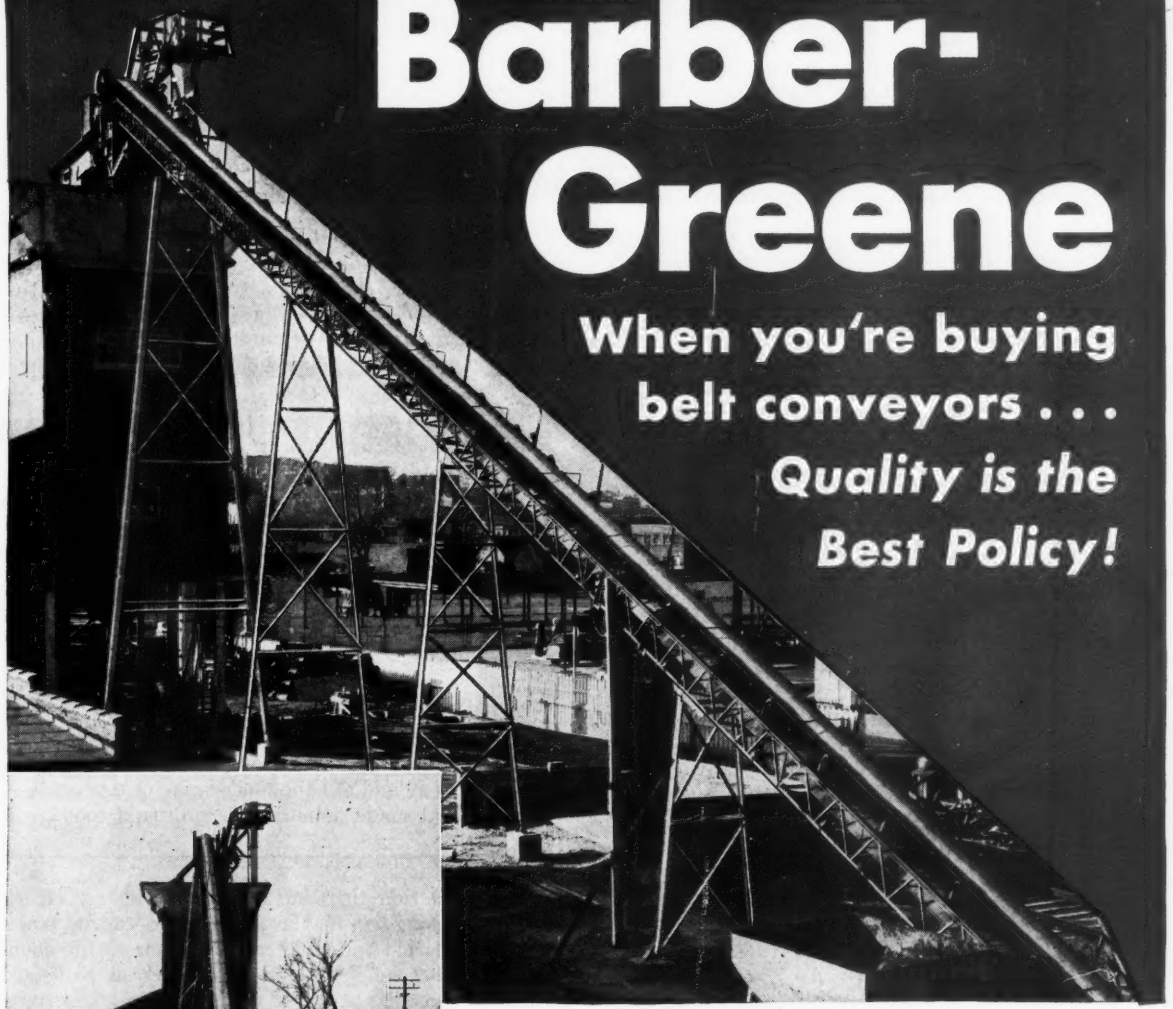
Dual Purpose Layouts

As was mentioned before, the railroad spur is strategically located with respect to both Plant Number 5 and Plant Number 6. This shows farsighted planning, which is sometimes woefully lacking. At times plant engineers locate docks and railroad facilities at some remote point of one particular building and then find that the shipping and receiving department must be relocated in another build-

(Turn to page 55)

Barber-Greene

When you're buying belt conveyors . . . *Quality is the Best Policy!*



Belt Conveyors by Barber-Greene are examples of infinite attention to engineering detail. You see this from the minute they arrive: the plainly numbered carriers and support members, the easily followed erection print, the simplified assembly on the job that comes from their standardized design. The units themselves—carriers, trusses, walkways, drives and takeups—go still further in proving the value of belt conveyors that are quality engineered. They are designed to last through longer years of service. And they do just that—while moving bulk materials at a high production pace at a low cost per yard moved.

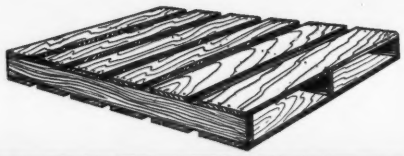
53

This B-G Belt Conveyor set-up makes efficient use of limited space: materials dumped into pits below tracks are carried to plant adjacent to spur.

BARBER-GREENE COMPANY · AURORA, ILLINOIS

Constant Flow Equipment

BUCKET LOADERS • BELT CONVEYORS • PORTABLE BELT AND FLIGHT CONVEYORS • CAR UNLOADERS • SNOW LOADERS • COAL LOADERS

ON THE  PALLET

NEWS · VIEWS · TRENDS

IT SEEMS a bit early to be talking about 1948, but the first meeting of the Exposition Committee for the second National Material Handling Show was held recently. Plans at present indicate that approximately three times as much exhibit space will be used as was available in 1947. The Exposition Committee appointed the necessary sub-committees for next year. Clapp & Poliak, Inc., the exposition management concern who handled the first show will handle the one for 1948.

The sub-committees will meet in May to discuss means and methods of making the 1948 exposition even more successful. The final complete registration at the show this year indicated that 12,200 were in attendance—extraordinary for a new show.

A RECENT questionnaire for one of the associations active in our field showed that 66% of the firms who answered were unable, within the framework of their present cost accounting systems, to determine the cost of material handling, as a separate element. It seems strange that so many companies cannot differentiate between operating, overhead and material handling costs. The spotlight is on this problem. The editors call your attention to the contest on this subject announced in our March issue and advertised in this issue. An article presented this month and other articles in preparation will cover this significant and important problem.

AMONG the studies in industrial engineering that were delivered before the Production Engineering & Material Handling Division of the Chicago Section

MAJOR OPERATIONS PRODUCTIVE HOURS
ALL OPERATING DIVISIONS

DIVISION	SHEET METAL WORK	ARC WELDING	ELECTRICAL TESTING	COIL WINDING	MATERIAL HANDLING	ELECTRICAL SOLDERING & HAND WIRING	PLATING	SPRAY PAINTING	SCREENCRAFT PRINTING	BENCH WIRING	CLAMPING
FACTORY SERVICE					1,492,369			300			3,000
FEEDER		43,960		80,000				10,000	60,000		6,000
MOTOR	462,304	94,000	351,267	72,000	362,640	64,000	73,992	24,000	120,000	84,000	130,729	60,000
SWITCHGEAR & CONTROL	230,368	847,544	862,584	82,000	211,920	1,234,000	253,616		170,000	90,000	248,640	125,000
TRANSFORMATION EQUIPMENT		414,206	222,536	72,000	252,360				100,000	60,000	32,200	175,000
PORCELAIN	34,900		12,600			105,600	35,100		7,860			
GEARING	192,000			34,000					6,250	2,500		15,500
MICARTA	8,600	1,000				528,000	9,984					
DAYTON ELECTRIC CO.	88,392		74,500	30,000		284,853	9,984	13,520	10,000	152,000	169,360	3,200
HOME RADIO	8,600	11,520	206,400			75,000	28,600	34,000	16,500		11,340	
X-RAY & INDUSTRIAL ELECTRONICS	75,600	18,992	673,972	99,000	104,960		122,200	93,000	34,000		14,340	
LAMP		43,200				521,200			3,300			
LIGHTING	4,200	4,320	6,000			34,500		4,800	11,000	2,200	24,000	4,800
ELECTRIC APPLIANCE	541,440	58,912	534,620	63,000	57,876	730,556	138,600	131,664	113,304	16,000	240,000	172,176	8,200
ELECTRIC APPLIANCE	117,600	8,400	90,000	127,000	24,000		76,500	42,600	144,000	132,000	495,000	453,600	76,000
ELEVATOR	84,000	60,000	7,360	1,200	4,800	171,500	60,000	12,600		1,200	4,000	9,800	24,000
SMALL MOTOR	474,600	52,580	282,600	120,000	200,400	264,000		122,600	34,000	50,000	400,000	357,600	60,000
STEAM & MARINE APPARATUS	672,000	962,000		76,000			85,040	34,680		130,000	80,000		160,000
METER				63,000						40,000	160,000		2,500
TRANSFORMER	100,360	334,560	451,512	78,000	907,704	1,639,800	42,192	252,780	13,104	92,000	220,000	242,786	134,000
M.E.D.	143,680	124,430	104,500		194,600	894,000	333,912	31,096	6,816			341,760	
TOTAL YEARLY HOURS	3,270,832	3,034,064	3,902,927	1,092,200	2,362,640	6,153,060	1,859,488	1,162,218	432,910	940,510	2,047,700	2,251,534	871,500

of A.S.M.E. was one by Charles Kells. This pointed out that the number of man hours dissipated in material handling was almost 27% of the total in major operation productive hours at one of the Westinghouse plants. The chart on which this information was based is reproduced above.

Mr. Kells pointed out that engineers often work out heat equation speeds of cutting metals and power requirements most painstakingly, then determine the machine layout and flow of products by rule-of-thumb methods. It was pointed out that material handling thinking must now be based on a complete absence of a 50¢ per hour labor supply.

While much work is going to be done in the immediate future on the application of material handling systems in plants, there will be a great amount of intelligence employed on the re-application of modern systems of material handling, or re-application of old systems to a more efficient use.

THE Monorail Manufacturers' Association mourns the passing of their president and charter member, Earl T. Bennington. During twenty-eight years, he was an outstanding figure in the overhead handling field.

Bennington fathered the first motorized monorail system, and did the lion's share of the spade work that made monorail an industrial tool.

FOR some time there has been an interesting experiment going on in the shipment of citrus fruits between Florida and northern chain stores. The technique is to send a carload of oranges in palletized sacks. According to the report, no oranges were bruised in transit.

A sack of oranges weighs just under 8½ pounds. The pallets used carried seventy-five sacks. In addition to the saving in fruit that otherwise would have been damaged, the advantages in palletizing included savings in handling, reduction in time and labor costs, and reduction in another element in citrus fruit shipping—grating on floors for air circulation.

A vast amount of this experimental work is being carried on now, particularly in the food fields, to determine how to cut down distribution costs.

The next large field to be attacked is cotton bale handling.

THE Yale & Towne Mfg. Co. announces a new plant in Philadelphia of more than 600,000 square feet on a 93-acre plot. In the plant will be produced the various hoists, hand lift trucks, electric trucks, cranes, and other equipment manufactured by the Materials Handling Division of Yale, presently located at 4530 Tacony Street, Phila.

The new quarters will accommodate 3,000 employees on a single shift, some 900 more than are currently working on two shifts.

67% SAVING IN TIME AND LABOR

Acme Uni-Pak eliminates shipping damages, losses, complaints, for New York washboard manufacturer

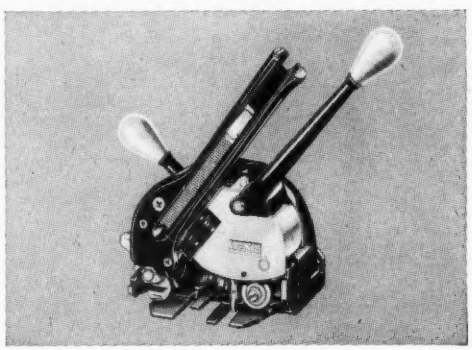
When executives at Albenco Manufacturing Incorporated became alarmed at the high cost of crating materials, labor, and an excessive number of shipping losses, they called an Acme Shipping Specialist. Without charge, he recommended changes that resulted in 67% saving in time and labor, 63% saving in materials, and gave Albenco a better shipping package.

Whether you make washboards or locomotive parts, Acme Shipping Specialists will be happy to advise you on your shipping problems without obligation.

See Acme's record in reducing costs and improving shipping in many industries. Mail the coupon below or write for the illustrated booklet, "Savings in Shipping."

The packing job starts with loose washboards like these. Under the old method a bundle of 12 washboards was nailed together with four 18" wood cleats, two on each side of the bundle. Cost was 7c for cleats, plus nails, per bundle.

Efficient Acme Uni-Pak method makes a bundle of 12 washboards with two straps to a bundle. Cost of material is 2½c each, a saving of 4½c per bundle. This type of packaging is three times as fast as the old method.



More savings ahead for Acme Steelstrap users—No. 3 Steelstrapper, the lightest tool made, is now available. Magazine holds 100 seals. Tensions, seals, and cuts the strap in one operation. Small base requires only 5-inch strapping surface. Two levers working in opposite directions make for better balance and easier handling.

Acme Steel Company, Dept. F-47
2838 Archer Avenue
Chicago 8, Illinois

Please send me a copy of your case history booklet, "SAVINGS IN SHIPPING."

NAME.....

COMPANY.....

CITY.....STATE.....

ACME STEEL CO.
CHICAGO

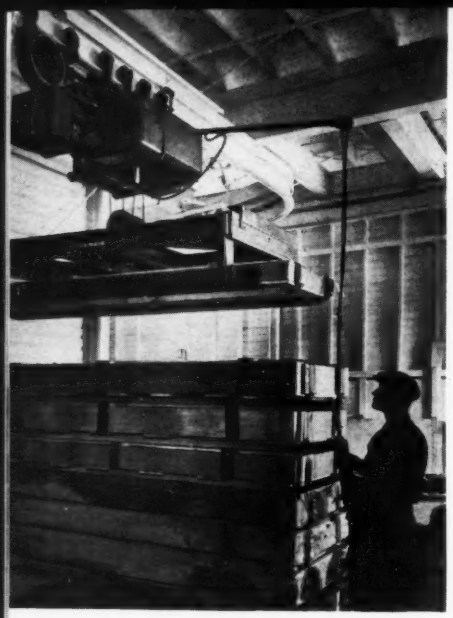
ACME STEEL COMPANY

NEW YORK 7 ATLANTA CHICAGO 8 LOS ANGELES 11

same manpower . . .

100% MORE P

Extention of this company's onora major role in enabling it to me a 1 crease with existing plant fa ities floor equipment was also modi d in fully coordinates ma factu



Pendant controlled hoist and sheet grab handle 4-ton sheet steel bundles in receiving.

MONORAIL

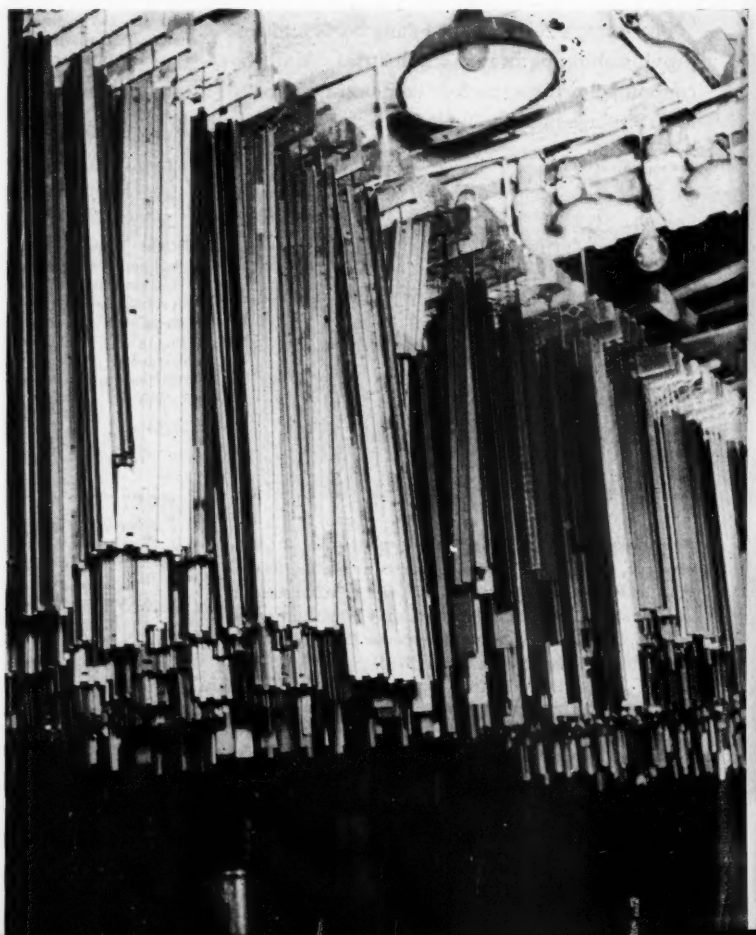
IN THE past 10 years production has almost doubled at the E. F. Hauserman Company, Cleveland, O., makers of movable steel partitions for offices and factories. The remarkable feature is, of course, that the greatly expanded requirements were met within existing floor space—through a carefully revised and engineered material handling program.

Processing, fabrication and handling are somewhat complicated by the fact that the company manufactures six basic types of movable partitions, each of which, in turn, is made in five standard heights and eight or more standard widths. Handling methods and equipment, therefore, must be versatile to move the multi-sized structural members, sections, etc., from receiving through fabrication, assembly and finishing to shipping.

Incoming raw material is received by truck at a sunken loading dock located at the sheet steel warehouse. Bundles of sheet steel ranging in sizes up to 5′ by 12′ weighing from four to five tons are unloaded from trucks at the dock and are moved directly into the warehouse by a monorail system which extends from over the trailer bed straight into the warehouse for a distance of approximately 60′.

Grab With Hand Wheel

A pendant controlled five-ton hoist, powered for horizontal movement by a push-pull tractor, is used in conjunction with a hand-operated sheet grab to move the bun-



Hang line at Finishing Department. Monorail cars on double track are loaded and checked.

. . . . same floorspace

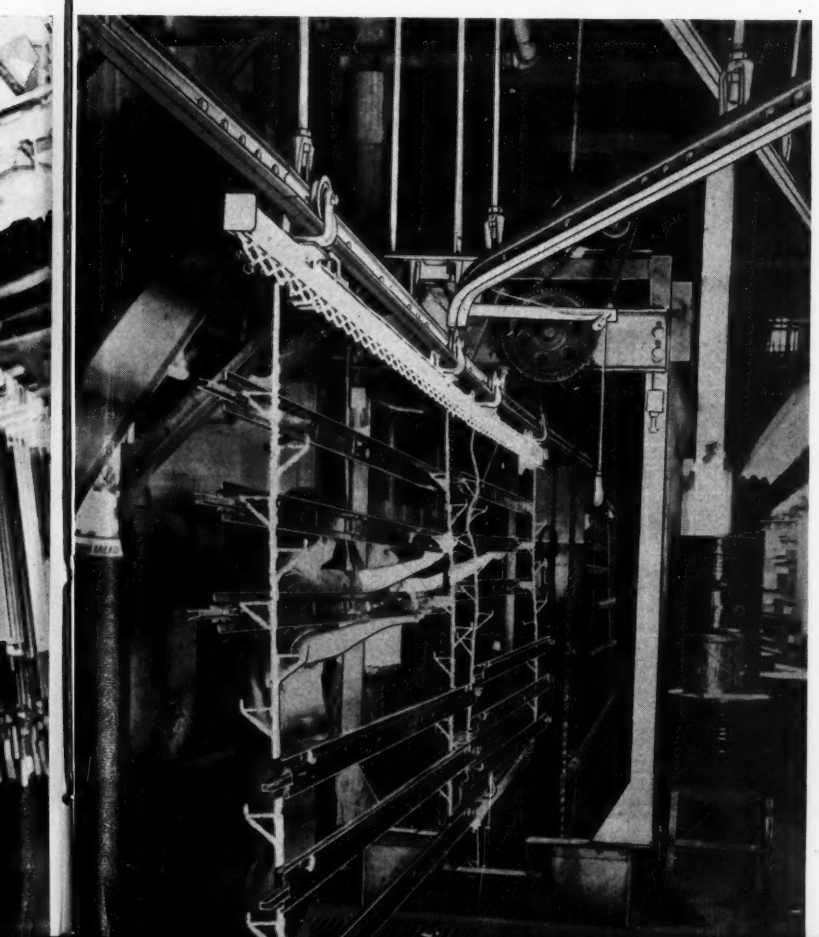
PRODUCTION

pany's monorail system has played a t to me a 100 per cent production in- ant fa ities and manpower. On-the- o modi d in the program that success- es ma facturing operations.

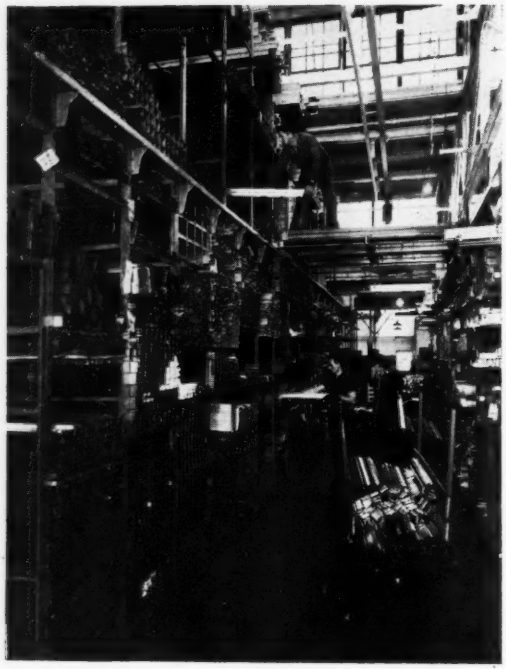
A car is transferred to double-track for lateral movement by automatic switch.

dles directly from the trailer bed in the loading well into the warehouse. The sheet grab used in this operation is built of angle iron members. The sides and bottom of the grab jaws are designed to fit the contour of the bundles. The 90-inch-long jaws expand to a maximum internal width of 60′; maximum thickness of the bundles which can be handled is 9″. The grab jaws are controlled by a hand wheel which opens and closes them around the bundles. Within the warehouse area, three parallel monorail tracks with manually operated tongue switches are used to store the bundles of sheet steel in three rows extending the 50-foot length of the warehouse. These are stacked to approximately seven-foot heights, the bundles separated by wood runners or 2 by 4's so that the grab jaws can be closed under the edges. With the use of the monorail hoist and sheet grab the two-man warehouse crew is able to receive, store and transfer to the production department approximately 100 to 150 tons of sheet each week.

Prior to the installation of this system, company officials state that the same operation handling only half the tonnage required a crew of from four to six men. Each sheet had to be handled individually in receiving. A large storage area in the yard was required because the workmen could not stack above shoulder or waist level. The present receiving and warehousing operation, using the four-ton capacity sheet grab and handling close to 50 per cent more volume, is accomplishing the same operation with a 300 per cent savings in direct handling costs and in approximately 50



Degreasing conveyor supports four independent track sections which lower the cars.



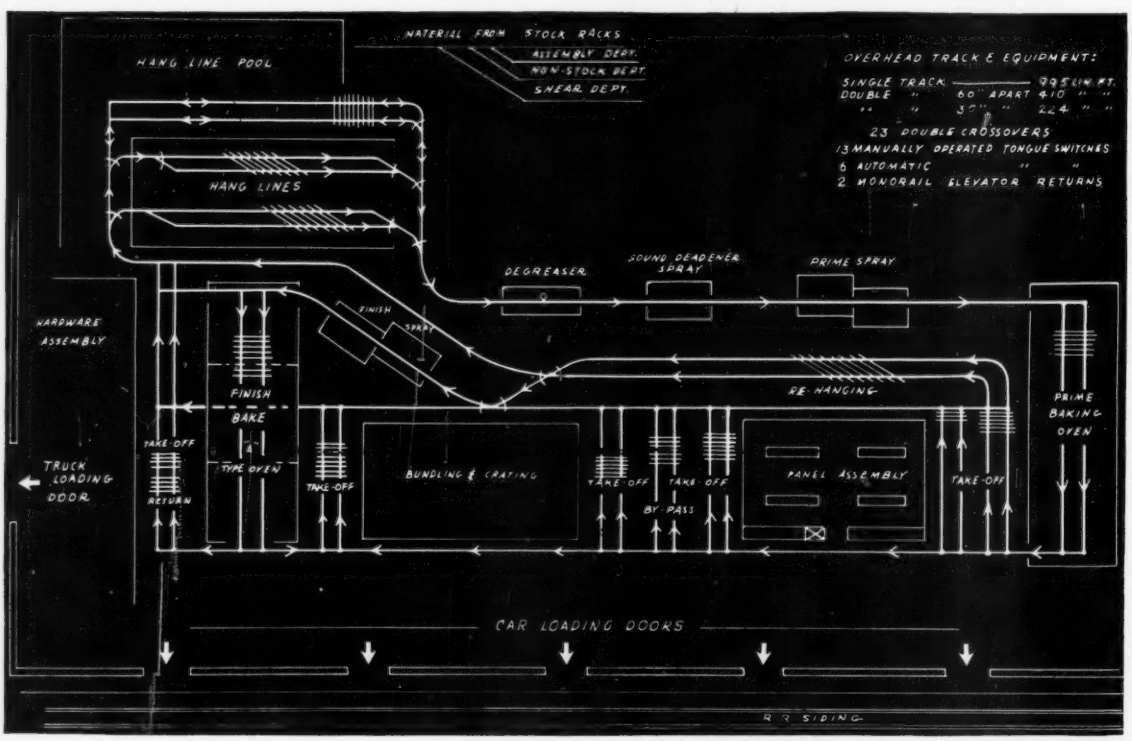
Left: Storage to 20-foot height made possible by use of wheeled platform on top of lower shelving. Below: Finishing Department flow chart showing hang lines, main track with by-pass and take-off sections serving assembly and crating.

per cent of the storage area formerly required. Also, because of the high stacking made possible by the hoist and grab, the storage of the high-grade sheet steel has been brought into the factory, greatly reducing losses caused by rust and corrosion.

Tierable Steel Skids Save Space

A carrier track extends 75 feet from the warehouse into the main plant, terminating adjacent to the power shears where the initial cutting operation is performed. Racks are located close to the monorail to permit intermediate storage. The sheet grab and hoist move the raw material from the storage area to the first manufacturing operation where the bundles are unloaded on four-wheel platform trucks 40″ by 96″. From the trucks the sheet is either placed in the racks or wheeled to the shears to be cut to sizes required for subsequent forming operations. The trucks used in this department are made of welded channel iron with wood decks. Two-by-fours or special box-shaped supports are placed on the truck beds to build up the loads of sheet to working level of the shear operators. As the sheets are cut, the pieces are loaded on steel skids equipped with 37″-long removable channel iron stake side supports. The use of these stakes on the steel skids is noteworthy, because a bracket welded at the top of each stake permits skid loads to be double-decked by resting the upper skid in the four supporting stake brackets of the bottom unit. The company has realized considerable economy of space in the press department through the use of this device.

After the sheet has been cut to required size, the skid loads are moved to the layout department by a 10,000-lb., high lift platform



truck. Punching and forming indications are made and the skid loads moved to the press room. Upwards of 200 skid loads are kept moving through progressive blanking, stamping and forming operations in the press room by means of the high lift platform truck and hand lift skid trucks. A single skid load of flat cut stock leaving the shears often requires five or six skids to handle the same number of pieces progressing through the forming operations in the press room.

As the material leaves the shears, it moves in two general directions. The large size panel plate sheets are moved to the assembly department by platform truck. The smaller re-inforcing ribs and other structural members which require press work are moved by skid load, as mentioned earlier, through the press room and, upon completion of the forming operations, to the stock department. The semi-finished parts used in the assembly of partitions are stored in five 60′-long by 10′ high stock sections facing on three eight-foot aisles. The stock is pulled from this department as required for use in assembly and in the finishing department.

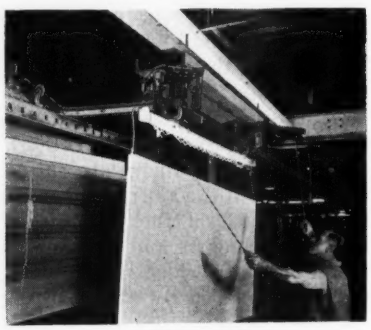
Movable Platform For Balcony Storage

Because of the extreme range of sizes and shapes of partition structural ribs and members (15,000 sizes and shapes), these units require extensive storage facilities. The company has been successful in keeping floor space in this department at a minimum by developing a double tier of shelving in one section. This is accomplished through the use of a wheeled platform which straddles the eight-foot aisleway on the top of the 10-foot-high racks. The wheeled platform, eight feet wide by six feet long, rolls the full length of the 60′ aisle, in effect forming a balcony. This arrangement permits the use of a second bank of shelves in which structural members are stored to a total height of 20 feet. Orders are made up on two-wheel hand trucks with swivel casters mounted at each end. Wood sides support the large loose loads during movement to either the assembly department (where steel ribs are spot welded to the panel plates) or to the hang line pool for assembly on the monorail

track of an order for processing in the finishing department.

Monorail Serves Finishing Department

Reinforced panel plates from the assembly department, other plates directly from the shears and parts from the stock department are



Discharge station at finish bake oven. Cars transferred to main line by cross-over switch.

brought together at the hang line pool. The material is checked here to see that all of the parts for each order are on hand. The pieces are hung on monorail carriers which will convey all the parts required for a single order through subsequent finishing steps to shipping. The parts are carried at working level throughout the finishing department by the monorail system.

Carriers, called cars, used on the monorail system are 90″ long. They are suspended from the track by fork-mounted swivel wheels located 60″ apart. The monorail system in the hang line section consists of a double track. Here the cars move sideways during loading to take fullest advantage of space. Three double tracks in the hang line section are used in the car loading and checking operation. Space is at a premium, so two of the double tracks are spaced 30″ apart which supports the cars at a 45° angle to the direction of travel. The diagonal arrangement accommodates four cars per foot, while the third section of double track mounted 60″ apart will take only three cars per foot.

Four types of car racks and six types of hooks are used to suspend the panel plates and the multi-shaped structural members from the cars. The racks and hooks are hung from a strip of "Steelcrete" (expanded metal) which extends

along the bottoms of the carriers. From the three double track sections in the hang line room the loaded cars advance through automatic tongue switches to the main single track for movement through the finishing operations. The monorail system in the finishing department is complex. It consists of approximately 1,000 feet of single track which serves as the main feeder lines. Six hundred thirty-four feet of double track spaced 60″ and 30″ apart serve as bypass lines, and as take-off line sections at the panel assembly and packing departments. The system of lines is shown in the accompanying flow chart.

First stop in the line is at the degreasing station. Here the cars are lowered into the vapor degreasing pit by means of an endless chain conveyor-type elevator. Four 14′ independent sections of monorail track on eight-foot centers are supported at each end by chain conveyors. The cars are pushed on the independent sections of monorail track, lowered into the tank, and at the completion of the degreasing operation return to main track level where they continue to the next processing station.

Conveyorized Oven

The cars move in a straight-line flow through two paint operations. A sound deadening material is sprayed on some units in the first booth which is built over the monorail track. The second paint station, consisting of two booths through which the track runs, applies the prime coat to both sides of the partition parts. The track continues into the conveyorized prime baking oven. Here the cars are picked up by a chain conveyor and are carried laterally through the oven. Maximum use of oven space is obtained by locating the conveyor hooks on five-inch centers. An inclined section of monorail track at the end of the oven conveyor gravity discharges the cars to the main section of track which extends at right angles from the prime oven.

Gravity Line Returns Cars

The panel assembly department is located immediately adjacent to

(Turn to page 56)

1947 EXPOSITION ROUNDUP

Concluding part of papers presented at the First National Material Handling Exposition

HANDLING IN THE CERAMIC INDUSTRIES

By D. B. HENDRYX
Chief Engineer
Harbison-Walker Refractories Co.,
Pittsburgh, Pa.

THESE remarks will be confined to the manufacturers of heavy clay products. The making of light ceramic objects, such as chinaware, uses relatively skilled labor in a large number of light operations to manufacture articles selling at more than $300.00 per ton. The heavy clay products branch, which includes building and fire brick, hollow building tile, sewer pipe and similar products, uses unskilled labor to mine, manufacture and handle large quantities of heavy materials that may sell at $6.00 to $20.00 per ton. In this field, the test of a successful plant is the handling of large tonnages with the least amount of physical effort, with machinery built for heavy loads and to resist the wear of abrasive materials.

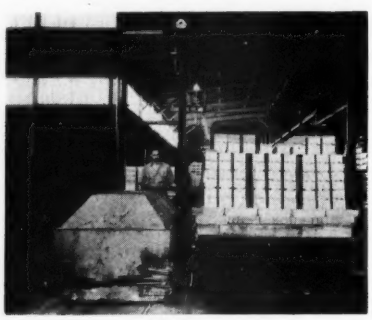
About 40% to 50% of the cost of making brick is the direct charge for labor. Part of this is spent for mining the raw materials and hauling them to the plant, and part for the grinding of these materials and handling them through the various manufacturing, storage and shipping operations. A survey of labor costs in a number of plants would indicate that the figures given on the next page might represent a fair picture of the industry.

These figures indicate why so much interest is being shown in material handling equipment and in meetings like this one in Cleveland.

In an old style bee hive kiln plant, regardless of the manufacturing method used, the brick and fuel are moved at least twelve times by hand, and seven of these

From tunnel kiln cars to stock shed refractory shapes are transported by pallet load.

movements involve a complete rehandling of the product. In contrast to this, in a modern tunnel



Slow-speed electric locomotive moves car of burned brick from the kiln to stock shed.

kiln plant making a high grade product, the brick are rehandled only 3 times. If the product is common brick, only 2 handlings are necessary, and in some cases only one.

The mining of the raw materials will only be touched on here, as it is a subject in itself and covers too wide a field. Suffice it to say that hand labor in open pits and quarries has been largely replaced by mechanical shovels, trucks, power haulage equipment, and power scrapers for stripping. In underground mining, much clay is still

Not by wheelbarrow: bulk raw materials are quickly unloaded by this powered scoop truck.

Labor Costs

Wage rates . . increased 45% since 1940

Labor Costs per M brick in spite of some additional uses of labor saving machinery . . increased 65% since 1940

Productiveness of labor, even with principal piecework values unchanged . . . . reduced 12% to 25% since 1940

loaded by hand because it must be sorted, and separated, but mechanical loaders are used in a few clay mines and in many coal mines.

HANDLING IN THE AUTOMOTIVE INDUSTRY

By N. M. LONEY
Director—Works Engineering
Fisher Body Division
General Motors Corporation, Detroit

IN ORDER to use mechanical handling at its maximum efficiency in such a manufacturing plant, it necessarily must be laid out originally on a much different scale than if intended for the old style manual handling of individual pieces. Ample space and facilities must necessarily be provided at the receiving and shipping docks so as to permit the ready movement of the mechanical equipment, and, correspondingly, ample aisles must be provided if it is desired to have all the stored items in the warehouse readily accessible. Very good use may be made of tierable work carriers, where individual items or packages may be loaded into such racks and handled in from 3,000 lb. to 6,000 lb. loads in one operation into storage and tiered so that the entire available space below the ceiling may be utilized, and correspondingly removed and set at a very convenient spot for the first operation entirely by mechanical means.

After the material is delivered to the first operation on a progressive manufacturing line, a great deal of judgment must be used as to whether it will be transported from operation to operation by floor or ceiling conveyors, or whether containers of various kinds are used for such purposes. If the operation is such that all the ma-

chines on the line run at the same rate, undoubtedly the conveyor is the best tool. However, there are many operations where various machines on a line run at different speeds, and it is necessary to temporarily store partly fabricated items. In such cases, the container is superior to the conveyor for the reason that it eliminates the manual placing of each individual article on or off the conveyors, and also, its insertion into or removal from storage racks.

There are several interesting variations in the handling of material between processes where many ingenious uses may be made of attachments to lift trucks, or where combinations of conveyors and containers may be very profitably used, as, for instance, in the fabrication of small parts where it ordinarily might be necessary for the operators to reach into containers on the floor adjacent to the process and handled in small quantities. These parts may be fed directly from the machine to portable elevating conveyors, with portable bins or containers at such a height that the parts may be fed to the next process by gravity. A variation of this is to provide the lift truck with suitable forms and rotating devices so that small parts may be elevated in containers by lift trucks and dumped into permanent bins by the inversion of the container, again feeding the next process by gravity.

The warehousing of finished parts awaiting shipment is also very important. Many years ago, there was a great deal of discussion on the possibility of conducting manufacturing processes without much, if any, warehousing at either end of the process. I believe that there are few, if any, advocates of getting along without warehousing of the incoming materials. There are, however, still many advocates of attempting to ship directly from the process. From the standpoint of the Material Handling Department, this is not so desirable, as the operations of shipping are then tied in so intimately that any minor interruption of the scheduled delivery from process interferes with the planned shipping operations. Hence it is quite likely that the cost of providing storage for finished materials is well justified.

This brings up the importance of a strictly controlled inventory of all materials. If any one item of the stock on hand is in such volume as to overflow the designated planned area in which it is to be handled and is placed in a location reserved for another article, then the entire system progressively deteriorates and soon becomes unmanageable. This also often leads to the purchase of excessive equipment in which to store such material; and no system of mechanical handling can succeed where the investment in handling equipment and buildings for the material is allowed to go uncontrolled.

Another important consideration is that the character and type of labor employed in handling material has been changing. With a properly designed mechanical handling system, we need no longer put a premium on mere brawn but need at least semi-skilled men. Material handling is increasingly becoming a trade instead of being a mere common labor occupation. This means that considerable attention should be paid to wage

classifications in this connection.

The equipment manufacturer also has an important part in the general scheme. He may contribute to the general welfare of industry, as a whole, and, incidentally, to his own, by a greater use of equipment which he manufactures. With a few notable exceptions, it has been necessary for the users to demonstrate to the manufacturers of equipment that it should be produced as far as possible on a mass production basis so that costs may be kept down to a point where the original investment will permit the wide use of such equipment. As an example in point, when the speaker first attempted to promote the use of pallets by suppliers, an exhibit was arranged in which approximately 60 commodities were packed on pallets to demonstrate to the suppliers that there would be sufficient economies for them as well as for the user to justify the necessary investment. At that time, the cost of lift trucks was so high that many of the small suppliers could not be persuaded to adopt them, and equal difficulty was experienced in having railroad and truck companies install equipment suitable for the handling of pallets at various transfer points.

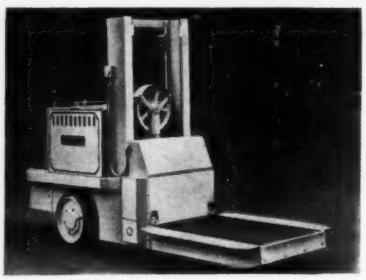
The same is true of the construction of permanent returnable containers. In the early history of the adoption of this system, metal fabricators were accustomed to look at the manufacture of this equipment as a job shop operation, and when a manufacturer was finally located who was willing to make an investment in jigs and fixtures and some approach to a progressive line of manufacture, it was found possible to provide this equipment for about one-half the price per pound that was necessary in the job shop operation. Under the latter condition, it probably would have been impossible to amortize the cost of the investment, and the present system which employs some 45,000 tons of steel in its various ramifications within one division of the speaker's employer might never have come into existence.

If the speaker may be pardoned for offering gratuitous advice, it would seem that the material handling equipment business should be handled on a volume mass production basis.

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13.

DIE HANDLER ASSEMBLY

NP24—The Mercury Manufacturing Company announces a new die handler assembly, which is built into a Mercury "Mogul" five-ton High Lift chassis. It can also be



furnished on Mercury's three-ton chassis, in either high or low Lift models.

This design consists of two power driven die movers, operating in machined slots at the sides of the load platform. Each die mover is driven by a compound wound D.C. motor through a Brad-Foote Gyro speed reducer and roller chains. Independent control is effected by two push button operated magnetic contactors. Push buttons are conveniently located on the operator's dash. Additional controls at the rear of the load platform may be had if desired.

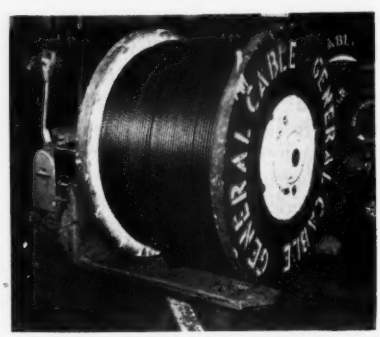
ALUMINUM HAND TRUCK

NP25—Trucks said to have low weight and high load factors have been introduced by the California Pallet Division of Tobey International Company. Three sizes are made. Truck weights range from 68 lbs. for a 24" x 48" unit with 6" wheels, to 130 lbs. for the 36" x 72" model with 12" wheels. All trucks are equipped with Aerol heavy-duty wheels, with permanently sealed lubrication. One handle is standard equipment, but spe-

cial handles or drags are available, as well as automatic couplings for tractors, it is stated.

CABLE TRANSPORTER

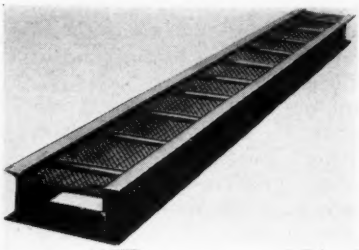
NP26—Designed to handle reels or similar bulky cylindrical items, this pallet truck is a modified version of the Transporter battery-powered hand truck made by Automatic Transportation Co. Forks



are engineered and widened to straddle the reel when in lowered position and to lift it from the floor when raised. Drive unit and operation are identical to those of the standard Transporter, the only modification being the forks. The unit was designed according to specifications of the General Cable Company, which uses the truck to handle reels of finished cable in the manufacturing plant.

ROLLER TRACKAGE

NP27—EPCO offers roller trackage for transporting paperboard rolls, barrels, bales of cotton, etc.,



on plant floors. Normally requiring the time and muscle of several men when handled manually, these weighty materials roll along

smoothly on ballbearing EPCO Roller Trackage, it is claimed. The device is quickly installed, requiring a trench in the floor six inches deep and 14 and five-eighths inches wide. EPCO comes in standard units of 10 feet. Other lengths, curved trackage and turntables are also available.

BRIDGE RAMP

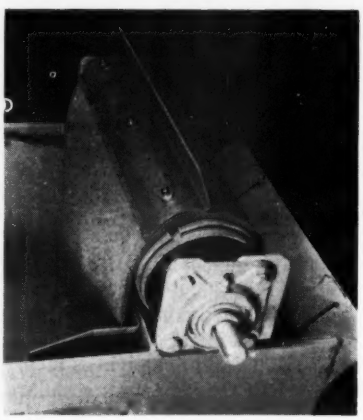
NP28—Additional safety features are said to be incorporated in the design of the metal bridge ramp

manufactured by Pallet Engineering Company. Positive locking de-

vices are located on each side of the ramp and independent of each other. High side guards prevent injury or accident to operator, equipment or load, it is stated. Lightweight metal construction permits one man to lift and position it. The ramp is crowned to compensate for different levels between car, dock, trucks, etc. The diamond safety plate eliminates skidding. Perfect fitting edges permit easy entry. Reinforced underneath, the dock will support maximum loads, states the manufacturer.

IMPROVED CLEAT

NP29—Development of a new curved cleat that, it is claimed, cannot be pulled loose regardless of the condition of the conveyor belt is announced by The Rapids-



Standard Company, Inc. The cleat is formed from 12-gauge steel, and is fastened to the conveyor belt with round-head bolts, hug-locks and a 13-gauge steel reinforcing strip. Fastening of the cleat entails drawing a small area of the belt within the concave side of the bottom leg of the cleat. This frees the reinforcing strip from contact with the conveyor bed and provides a grip that keeps the cleat solidly fastened. The curved cleat, projecting 1½" to 2" above the belt, will handle stampings or other products. Its design prevents lodging of stampings between belt and cleat when passing over the pulley, the manufacturer states.

LOAD PUSHER DEVICE

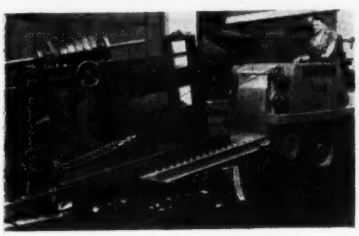
NP30—A pusher device having a maximum stroke of 52 inches and a thrust capacity of 4,000 pounds, is

available on the Clark Carloader, Utilitruc and other models made by the company. The pusher is

practical for nearly any type of load, it is stated. Retainers are used to hold the pallet in the job illustrated, but other types of loads may be deposited with the pallet if desired. The pusher is also used with self-contained loads which do not require a pallet, according to the release.

ROLLER PLATFORM TRUCK

NP31—The Yale & Towne Mfg. Co. announces a variation of the heavy-duty power truck, designed for manipulation of massive ma-



chinery and crates into carrying position by means of an integral roller-ramp and cable-draw system. The device is called the Gravity Tilting Platform Electric Truck. The roller platform falls into ramp position when unlatched, and winch-drawn cables encircle the load to pull it onto the ramp and cause it to rock back into horizontal position. Three pulling levels for the cable lines may be used, the lowest being direct from the cable drum. The higher idler sheaves are employed to obtain higher purchases on such loads as machinery and bulky crates. When empty, the roller platform is so balanced that it may be rocked into the horizontal position for empty return trips.

AUTO-STENCIL CUTTER

NP32—An automatically fed circular stencil-cutting machine is being offered by Diagraph-Bradley Stencil Machine Corporation. Three sizes of the automatic feed circular stencil-cutting machines are available. Stencil letters 1-¾ inches, 1-½ inches, and 1-¼ inches high, respectively, can be cut on these three machines. All three may be converted to straight-line stencil cutting, the manufacturer states. Three lines can be cut on Models G and H; and two lines on the Jumbo. The third line can be cut on the Jumbo by hand feeding the machine. The equipment is applicable to equipment in barrels, drums, or other cylindrical containers.

HANDGUARD

NP33—Many line production jobs that require only light protection on palm, first finger and palm side of little finger, can be speeded up

safely, it is claimed, with a hand-guard made by Industrial Gloves Company. The guard is designed to leave thumb and finger tips free for picking up material and to provide flexibility through open-back construction.

ALUMINUM ALLOY CASTER

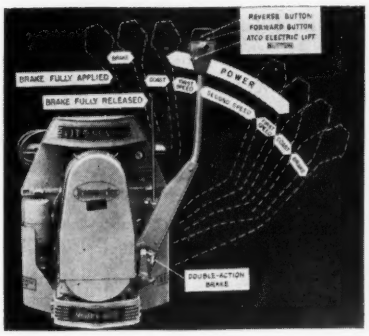
NP34—An aluminum alloy rubber-tired caster in both rigid and swivel types is announced by the Aerol Company. It embodies such features as a heavy duty shake-proof king pin, labyrinth dirt seal to protect lubricated bearings and extra offset for instant trailing. Aluminum alloy cuts down dead weight without sacrificing strength requirements, it is stated. Tapered Roller Bearings on the race assure straight, even tracking and sensitive swivel action even under heavy loads. Both thrust and king pin bearings are factory-greased to eliminate all axle wear and side-play. Aerol casters come with all-purpose solid rubber tires that are said to resist oil and water, and the manufacturer states they are guaranteed not to separate from the wheel core. They are available in a complete range of sizes in either swivel or rigid types.

HAND LIFT TRUCKS

NP35—Featuring a new lift and for the first time alternate types of lift—electric lift and foot lift—the 1947 models of the Transporter motorized hand truck, manufactured by Automatic Transportation Company, were announced recently. The Transporter with electric lift, says the manufacturer, is the first electric-lift hand truck designed to operate with a standard 11-plate battery.

An electric-lift pump and motor is said to use less current than the reserve left in the foot-lift Transporter's standard 11-plate battery at the end of a full working day. To simplify operation of the electric lift model, all controls—forward and reverse, speed, lift, steering and brake—are so arranged that they may be regulated by one hand and operated virtually simultaneously, according to the announcement.

No lift and move, even with the



maximum load and to maximum height, requires more than five seconds, it is claimed. The same tests show that while raising to full height the lift uses less than 10 percent of the battery capacity in a normal day's work. Accessibility is an additional advantage. Guards are designed so as to protect the lift components from damage during operation and yet leave them accessible for maintenance.

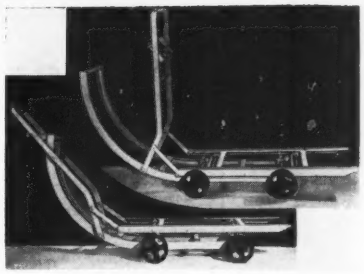
STRADDLE TRUCK

NP36—Announcement is made of a Model MH truck by the Straddle Truck Division of the Hyster Com-

pany. This latest Hyster model has a capacity of 30,000 pounds and by use of a sloping hood, insures maximum driver visibility. A new type hoist mechanism further assures ease of operation, it is stated.

LIGHT HAND TRUCK

NP37—A light hand-lift truck is announced by the Arcade Manufacturing Co. The truck is used in manufacturing plants for moving skid-loads, boxes and trays of material and miscellaneous items, states the manufacturer. Overall length is 70 inches, and the platform area is 11¾ by 43 inches. With platform lowered, the truck



has ample clearance under a skid-box. A pull lifts the load above the wheels, and locks securely.

Enter your paper in the FLOW Award Contest. For information see page 21.

INTER-COMMUNICATION SYSTEM

NP38—The Talk-A-Phone Company recently announced its new DeLuxe line of inter-communication equipment. Features found in these new systems include "Alnico 5" speakers, "Insta-Action" selector switch and a powerful high-gain amplifier which delivers the maximum output of "Voice Range" power. The special master station and sub-station in the KR-4010 series consists of one master station working with up to a total of 10 Sub-Stations. The system may be built progressively beginning with one master station and one sub-station; additional sub-stations can then be added as needed. Master stations can call any one or all sub-stations at will and receive an answer. Sub-stations can also originate calls by use of the "silent feature". Versatility, the manufacturer states, is stressed in sub-stations which may be installed in any remote spot up to 2500 feet from the master station, regardless whether power supply is available there or not. The master station operates on 110-15 volts AC or DC.

HYDRAULIC LIFT TRUCK

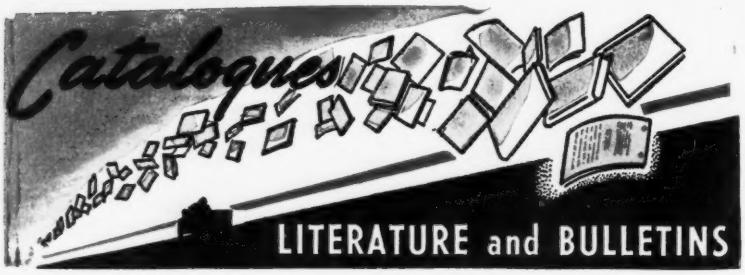
NP39—A new Weld-Bilt hydraulic pallet-type lift truck developed by the West Bend Equipment Corp.

has a two-ton capacity. Its six wheels are equipped with sealed ball bearings. A steering handle operates the hydraulic lift and an accelerator type foot pedal functions as the lowering release. Hydraulic operation is said to facilitate lifting. A patented front wheel equalizer has been incorporated in-

to the design. This device not only keeps the truck platform level, regardless of any bumps or minor obstructions in the truck's path, but it reduces whipping of the steering handle, states the manufacturer.

CONVEYOR SWITCH

NP40—Speedway Conveyors, Inc., announce its 45° or 90° angle spur which it is claimed can be placed in a regular straight speedways conveyor line to divert the flow from the main line to the spur. Constructed on the gravity principle of Speedways Conveyors, the 45° Flipswitch, it is said, can be mounted on standard Speedtrux stands or suspended between two sections of speedways conveyors. The 45° switch is available in 12″, 15″ or 18″ widths. Frames are welded, heavy 2″ x 1″ x ⅛″ steel channels, with 2″ ball-bearing roller wheels rotating on ¼″ cold rolled axles. Overall weight is 85 pounds.



The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

300—Tructractors . . . The complete line of gas and battery powered machines manufactured by the Tructractor Division of Clark Equipment Company is presented in a 36-page catalog. In addition to the familiar models of fork lift trucks and Clarkat and Clarktor towing tractors, the catalog introduces the new Clark "Yardlift" Series of pneumatic tired fork trucks. Also illustrated is Clark's wide variety of handling attachments for use on fork trucks. Included is the newly developed "Pul-Pac" for unit loads without pallets, the Schmidgall Brick Fork, the so-called citrus device for handling fruit and vegetable packages, and numerous other special items for handling particular commodities.

301—Conveyors . . . A new Speedways bulletin is illustrated with photographs of the company's material handling equipment in use in food plants, breweries, bakeries, fisheries, freight depots, etc. Stressing the need for efficiency, speed and low cost in the handling of boxes, crates, cartons, cases and containers, the bulletin presents details on construction and operation of the Speedways Gravity Wheel Conveyors, "y" Flipswitch, 45° Flipswitch and Speedtrux.

302—Casters . . . A complete industrial Caster Manual has been issued by The Rapids-Standard Company, Inc. Technical data and illustrations printed in four colors give information on how to select the correct caster for the job. Of special interest to caster users are specifications and illustrations, cutaway photographs illustrating points of strength. Models shown in the manual range from the Aircrafter with six-inch wheels to the recently announced Scout caster, a formed-steel series using a 3½-inch molded-on-rubber wheel.

303—Lightweight Hand Truck . . . The new lightweight hydraulic hand pallet truck offered by Lyon-Raymond Corporation is described in a bulletin recently released for distribution. Illustrations show streamlined design resulting from use of light metals and new construction techniques.

304—Wheels . . . A bulletin carrying illustrations and data on several popular wheels has been prepared by the Wisconsin Rubber Products Company. This line is completely described, including rubber composition, steel disc, cast aluminum, wheelbarrow types, etc. Covered are many types of wheels required by the industrial truck industry.

305—Magnetic Separators . . . A four-page folder just completed by The Homer Manufacturing Company, Inc. describes its line of permanent magnetic separators for use in eliminating tramp iron and steel particles and pieces during manufacturing or processing operations. This folder illustrates typical applications for various manufacturing and processing industries, such as foods, textiles, metals, liquids, plastics, minerals, paper pulp, seeds, grain, sand, chemicals, and others.

306—Tachograph . . . Wagner Electric Corporation has recently issued a new bulletin on the Sangamo Tachograph, a recording speedometer which furnishes a daily graphic record of a vehicle's operation, including miles traveled, speed traveled, time and place of stops, time out for stops, and other data. The bulletin explains the instrument's operation in a manner of interest to truck and bus fleet owners and discusses lost time due to traffic conditions of loading and pick-up delays.

307—Transmission Belting . . . Specifications and construction features of Monarch brand transmission belting are outlined by Hewitt Rubber division of Hewitt-Robins, Inc., in a new four-page folder. Monarch is claimed to withstand the shock loads of the heaviest service and to be especially effective when used in pulp and paper mills, stone crushing plants, mines, quarries foundries, saw mills, oil fields, sugar fields and other power transmission operations.

308—Oven Chain Lubrication . . . Two illustrated four-page folders are offered by the Bel-Ray Company, Inc., to describe its system and equipment designed for modern lubrication of hot oven chain. Schematic drawings are used to show the principle of the Bel-Ray system of positive lubrication, which is said to eliminate old hand methods.

OPPORTUNITIES

Men wanted Jobs wanted Lines available

Rates: for "Positions Wanted" $3.50 minimum, limit 25 words. For all other classifications $3.50 minimum for 25 words, each additional word 10c; boldface type or all capitals, $6.00 minimum for 25 words, each additional word 15c; limit 50 words. Box addresses count as five words. All insertions are payable in advance.

LINES WANTED

Manufacturers' Representative
New York City Area
Seeks Agency for a
Fork Lift Truck
Gas Driven
Have Large Sales Organization, Warehousing Facilities, and Maintenance Department. Box 7146, FLOW.

REPRESENTATIVE WANTED

To sell complete line of materials handling equipment consisting of casters, hand trucks, gravity and power conveyor, skids and pallets, hoists, etc., for newly established office in Syracuse. Representative selected must be well acquainted with local industries, have good previous sales record, and be able to run a branch office. Box 3747, Flow.

FOR SALE

FOR SALE—Approximately 500′ of Matthews Conveyor, practically new, ideal for foundries, lumber mills, manufacturing plants, etc. heavy duty; 10′ sections, 18″ wide overall with 4″ outside channels, 2¾″ rollers on 6″ centers, ⅝″ shafts, ball bearing, must be moved immediately, priced to sell. Charles S. Jacobowitz Co., 3080 Main Street, Buffalo, N. Y. Phone—Amherst 2100.

MEN WANTED

Materials Handling Engineer
Large middle west glass manufacturing company needs man experienced in material handling. Should have experience in conveyors, battery and gas driven trucks, palletizing, heavy packaging, warehousing, freight, and truck shipping. Previous glass factory experience not essential. Should be competent to analyze present material handling methods and make recommendations for cost reduction.
Give details of personal qualifications, age, work history, and photograph if available. Box 4347, Flow.

Experienced Conveyor Sales Manager
Thoroughly qualified sales engineer required by leading manufacturer of mass-production conveyor systems. Must have minimum of five years conveyor sales experience, solid conveyor engineering background. Engineering graduate preferred. Excellent compensation, future possibilities. Replies confidential. State full particulars first letter. Box 4147, FLOW.

SALES ENGINEER—experienced in selling of materials handling and construction equipment to industrial plants. Must have ability to direct others. Good opportunity with large equipment distributor. Box 4247, Flow.

BAR STOCK RECEIVING . . .
(Continued from page 32)

ing on the premises. The ensuing turmoil of rearranging and the cost incurred result in an expensive lesson against such a short-sighted policy.

It should be noted that the stock leaving the storage room may pass by way of (G) or (F). If the material leaves at (F) to be moved into Plant Number 6, the hinged bridge is used over the tracks. In cases where coal is being delivered, or the far end of the siding must be used in switching, the bridge is raised and again lowered in the opposite direction. Entrance into Plant Number 5 can be made either by way of (F) or (G), which will bring the stock directly to the machining sections where it is needed.

The truck well at (H) is also conveniently located to service the shipping and receiving dock for Plant 6. In going to and from both plants, truckers enter and leave via the driveway shown at the right of the flow diagram. Both docks at (A) and (H) respectively are joined to this passageway so that both plants are serviced.

Thus, with forethought an efficiently planned loading and unloading area can be centrally located not only to supply raw material, but also to be near the point of use. This latter fact has eliminated any long hauls to move the raw stock where it is required in these plants.

Good housekeeping makes for neatness and good working conditions, and the photo of the raw stock room will attest to that. Racking the material, however, is one important reason why orderly stacking is a comparatively simple operation. With the other handling devices provided, the material handlers have no reason to overexert themselves in keeping production supplied. Thus the job is accomplished without delay, and material losses are either reduced to a minimum or completely eliminated.

$1,500 in Cash Awards!
This prize money will be awarded for winning papers in the FLOW contest on material handling costing. You may have before-and-after figures suitable for a winning paper. See page 21.

100% MORE PRODUCTION . . .

(Continued from page 41)

the main line leaving the oven. Three double-track take-off lines at right angles to the main line are located on both sides of the panel assembly department. The cars are transferred to these short take-off lines by means of double cross-over switches. In the assembly of partitions at this point, a number of cars carrying small structural members are emptied. The empty cars are returned to the hang line section from this department. An air cylinder operated elevator raises an independent section of the track carrying the empty car to an inclined gravity return line.

The main line leaving the prime oven continues past the panel assembly department to the bundling and crating section. Double-track take-off lines from the main track are located on both sides of this department also.

Crating Done At Shipping Areas

Some car loads leaving the prime oven by-pass the assembly department. These move on a feeder track which carries them through finish spray booths to a finish bake operation. This is done in a conveyorized "A" type oven containing double monorail track and a chain conveyor system. The cars are transferred to the oven line by means of an automatically operated blade switch. The car swivel wheels ride on the track, but because of the incline to and from the oven the conveyor hooks located on 13" centers are used to lift the cars and keep the loads separated during ascent and descent. The oven conveyor hooks engage lifting lugs located between the car swivel wheels. At the oven discharge point the hooks are mechanically disengaged from the lugs and the cars rest on the double track ready for transfer back to the main line by means of a manually operated double cross-over switch.

After leaving the finish bake oven the cars are back on the main track. Take-off lines are located to either side of the finish bake oven and material leaving is shunted to these where the product is removed for packing operations.

The take-off line located to the

left of the "A"-type oven (see flow chart) is used for the products that will be shipped by truck. This take-off line is located near the loading dock, and crating operations for the LCL shipments are performed at this point. The dock is used for LCL truck shipments and will accommodate three small trucks, or two of the larger trailer units.

A railroad spur which will accommodate seven cars extends the full length of the building adjacent to the finishing department. The panel assembly section and the bundling and crating area are located adjacent to four car loading doors. This means that car loading of the crated products is performed with a minimum of handling.

It is apparent from a study of this operation, that the Hauserman Company, particularly through the use of its extensive monorail installations, has gained flexibility of handling to permit the most economical routing of the many partition components through the finishing operations with a sizable saving of space and manpower.

MISCELLANEOUS STOREROOM . . .

(Continued from page 25)

of this slower-moving but very necessary stock item. It was possible to pull it out or place it in storage through a normal 36″ aisle because the rack faced a bulk storage area which was stacked to a 72″ height only.

Reels Of Strap And Wire

These had been one of the worst headaches. An item that is 24″ in diameter and weighs 200 pounds (and over per reel) is no particular problem in bulk. But when virtually every reel carries a different stock, most of it used daily, the matter of tucking it away took some thinking. The answer, when arrived at, proved quite simple.

More 24″ deep bins were to be used for storage. The bottom shelves were shifted to a height of 27″ from the floor. Permanent chocks of light angle iron together with strips of sheet steel were inserted to tie and support the bin uprights. Thus the reels rolled in on end, being retained by the chocks. See Sketch 9. A "hoop stick" not only permitted effortless removal but facilitated delivery to the storeroom door. Protection for the material was another advantage of this method. Strap and rectangular wire often slivers due to loops interlocking when reels are stored on the sides. This does not occur in "end" storage.

Small Spools and Large

The analysis of magnet wire on spools revealed that small spools were as active as large spools, yet both were stored in 24″ deep bins. A 12″ depth would have been best for the 4½″ and 6″ sizes in the quantities used. However, a heavy increase in the use of the 18″ spools was forecast. Accordingly, 18″ shelving was set up and the 18″ spools were stored in them in the same manner as the 24″ reels are shown in Sketch 9.

Lead wire, lighter in weight, was placed on the top shelves. The 6″ and 8″ vertical shelf spacings used for smaller spools were concentrated in the eye-range areas. Since lead wire was issued by the foot, several of the faster moving items were placed on spindles to speed up delivery. The 12″ spools, weighing from 50 to 68 pounds, contained enameled wire which rarely looped on the spools. These were stored flat in bins 24″ deep, with a maximum lift of 54″ required. Increase in the use of 18″ spools would decrease the 12″ spool stock, and thus shelving space occupied by it could be converted to other uses.

Castings, Small Parts

Storage for castings, which followed the pattern of the spools, was assigned to bins, with small lots at eye level. Large lots were left in shop tubs. Very small sizes remained in shop pans which were placed on individual shelf racks.

Small parts and shop supplies presented little difficulty. Brought into orderly grouping, they were readily assigned to conventional shelving. Drawers were provided for very small parts, and this move released quite a little shelf area for reserve storage.

Bulk Storage

Bulk storage, finally, became warehouse stock. It was the amount in excess of that required for normal service periods, or the items which moved through the storeroom too rapidly to necessitate actual storage. The latter were in shop tubs, boxes, barrels, crates and cartons. Areas were left at rack ends where cartons of uniform size could be high-stacked, using the rack as a guide and, in some cases, as a support. Malformed cartons were lean-piled against the rack ends by shimming the stack off center with wooden strips, avoiding the danger of toppling. In such cases, piling gave access to both sides and, in other cases, to the end. As a result, several items were accessible in the same area.

Points Worth Noting

You may have noticed from the sketches that the uprights of some racks are continued beyond the storage opening heights. Such racks, when placed under a monorail track, could be used for bulk storage requiring hoist handling. With the upright extensions acting as retainers, safe storage was assured for items usually underfoot. Otherwise, every corner and wall

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SAVING STORAGE SPACE

BY USE of the sectionalized racks and lift trucks the Cleveland Graphite Bronze Co. has tripled the capacity of its storage rack tiered on top, providing safety in vertical space utilization. Skid-bin loads of bulk raw materials are likewise tiered by truck, in some

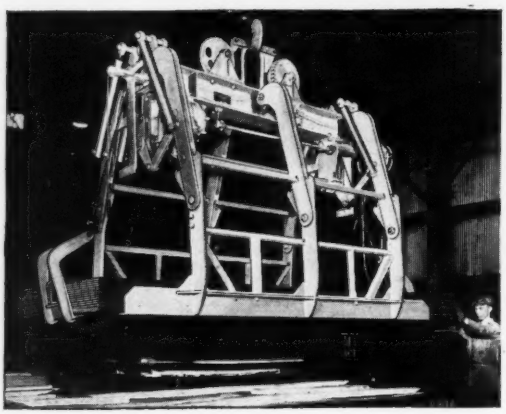
areas. Here the truck is shown stacking strips of copper and steel. Note the tapered tips of the rack posts, which fit into the slots of the instances resulting in a fivefold increase of storage space as compared with on-the-floor storage.—*Courtesy, Towmotor Corporation.*

area possible was marked off for barrels, tubs and other bulky containers requiring an aisle for service.

You have probably realized by this time that the revamped storeroom area proved to be ample, with sufficient reserve provided to anticipate future requirements. You will also have realized that the engineer was applying some fundamental rules of materials handling and storage practice. Among these were:

1. Determine what items should be handled manually; which require powered equipment.
2. Concentrate power-handled items so that expensive equipment is not misapplied.
3. Plan to use all racks and bins on hand which are in good condition, even at the expense of some efficiency.
4. Do a little thinking and devise some gadgets; they answer a lot of problems and make the whole job easier to "sell".
5. Keep your storage system as flexible as possible, considering changes in quantities per item, irregular shapes, and unusually long, wide or both long and wide stock. You never know what comes next.
6. Where storing manually, stay to a 96" top-height if possible. Use top shelves for light, bulky items, bottom shelves for heavy material. Concentrate small items in close vertically-spaced shelves or drawers from eye-level to just above the "stooping line".
7. Watch bin depth. 12" deep shelving (sometimes narrower) can save a lot of floor space.
8. Group racks with long stock around an open area where that area can service several racks and still be usable for receiving, service, etc.
9. Combine storing and service functions as much as possible.

With the job completed, it was now possible to install location cards, records, etc. through which effective stock control could be instituted. The cost of an addition to the building was saved. In addition, the losses avoided have amply justified the effort expended and the investment required.



You can produce only as much as you can handle

WHEN you use C-F Sheet Lifters to load, carry and unload loose or bundled sheets in and out of storage, you keep no machine or operator idle, waiting for material.

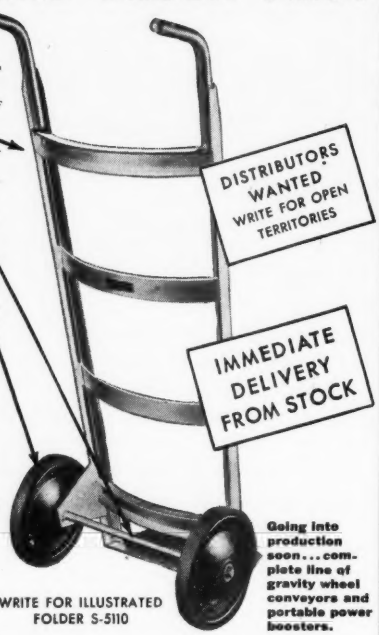
C-F Lifters provide a faster, safer and more economical method of handling sheet stock because they carry more sheets per load, have a tong action that grips loads tightly, preventing stock slippage or sag, yet design features such as wide bearing surfaces give full protection to stock edges. One man end or remote cab control keeps operator away from sides—stock can be loaded or unloaded in close quarters with resulting savings in storage room.

Jaw controlling mechanism provides infinite adjustments from minimum to maximum widths. Control is fast, positive. C-F Lifters have standard and optional equipment that will exactly meet any materials handling requirement you may have. Lifters are available in capacities from 2 to 60 tons or larger, in standard or semi-special designs. Write for new illustrated Bulletin—just off the press.

CULLEN-FRIESTEDT CO.

1320 S. Kilbourn Ave., Chicago 23, Ill.

Big HAND TRUCK value



Going into production soon... complete line of gravity wheel conveyors and portable power boosters.

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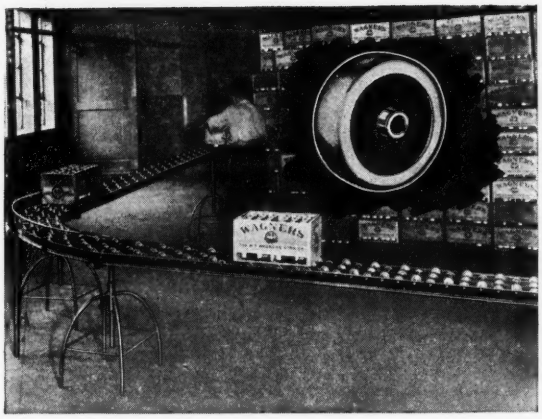

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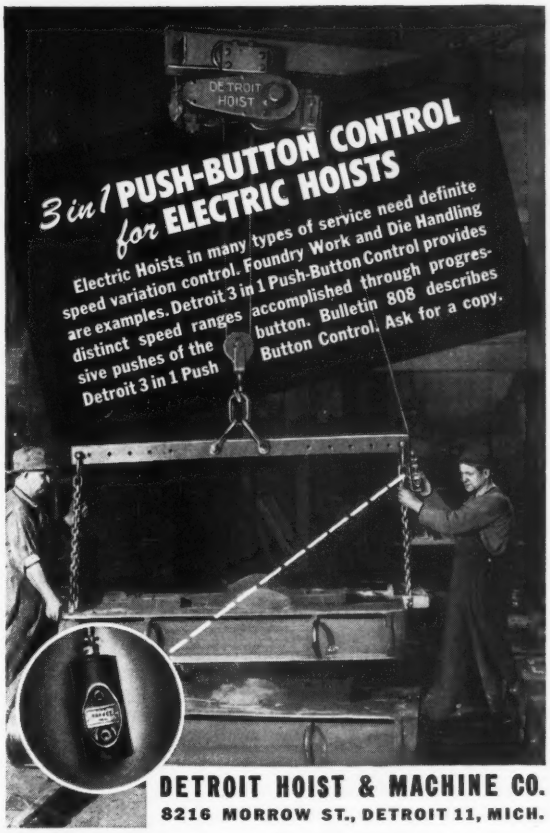

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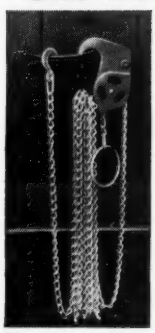

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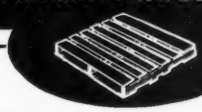

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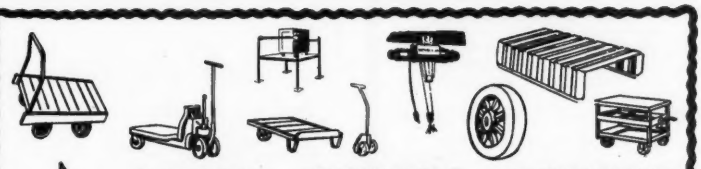

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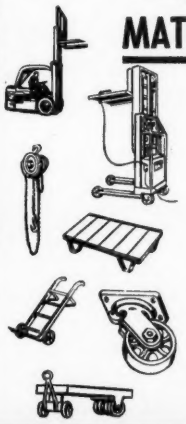

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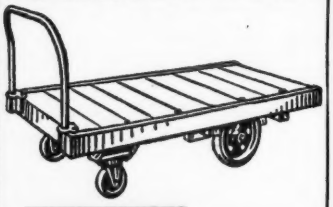

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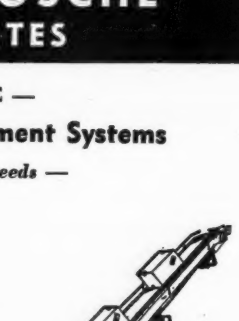

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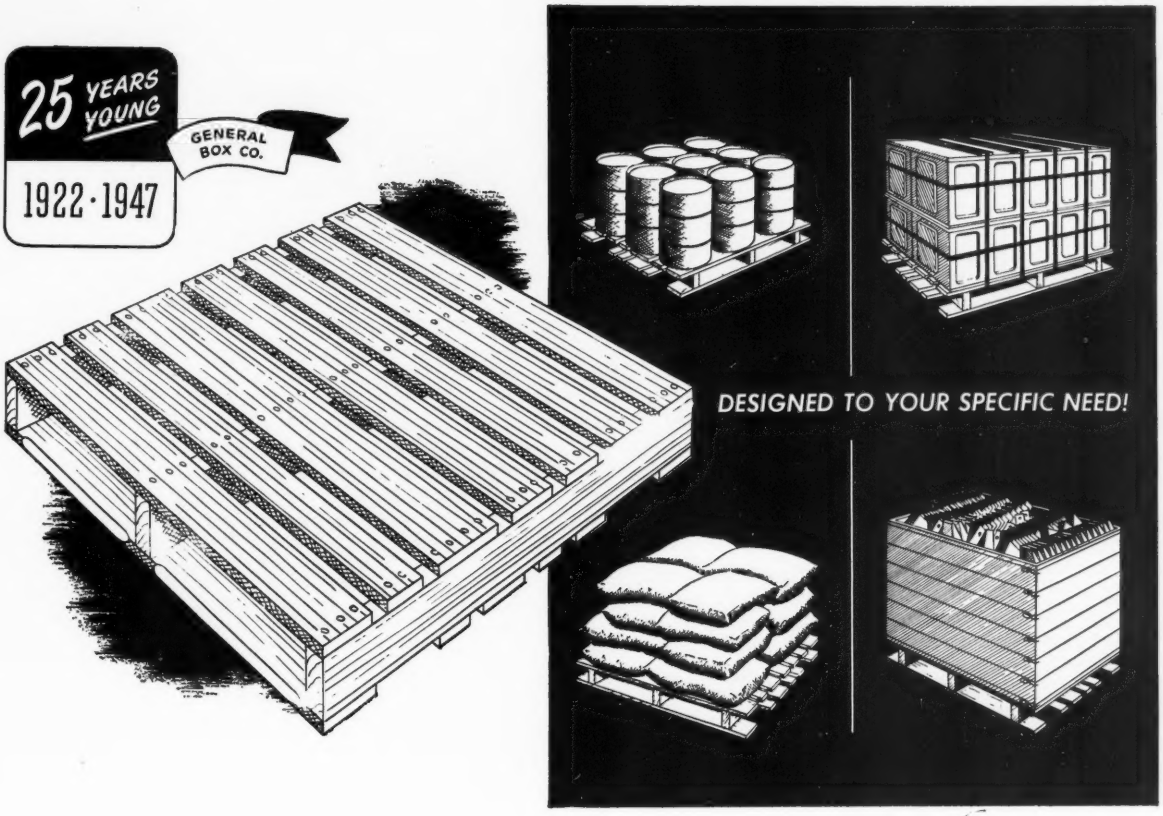

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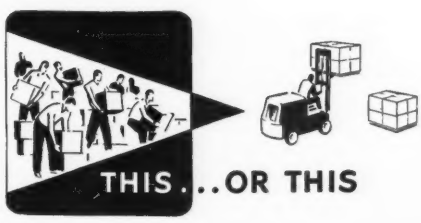
Generalift Pallets, Skids, and Lift Boxes are of sturdy hardwood construction. Designed for long life, rough handling, extra heavy loads—made to your specific requirements. For complete information, write for free Pallet Booklet.

ALL TYPES OF ENGINEERED SHIPPING CONTAINERS

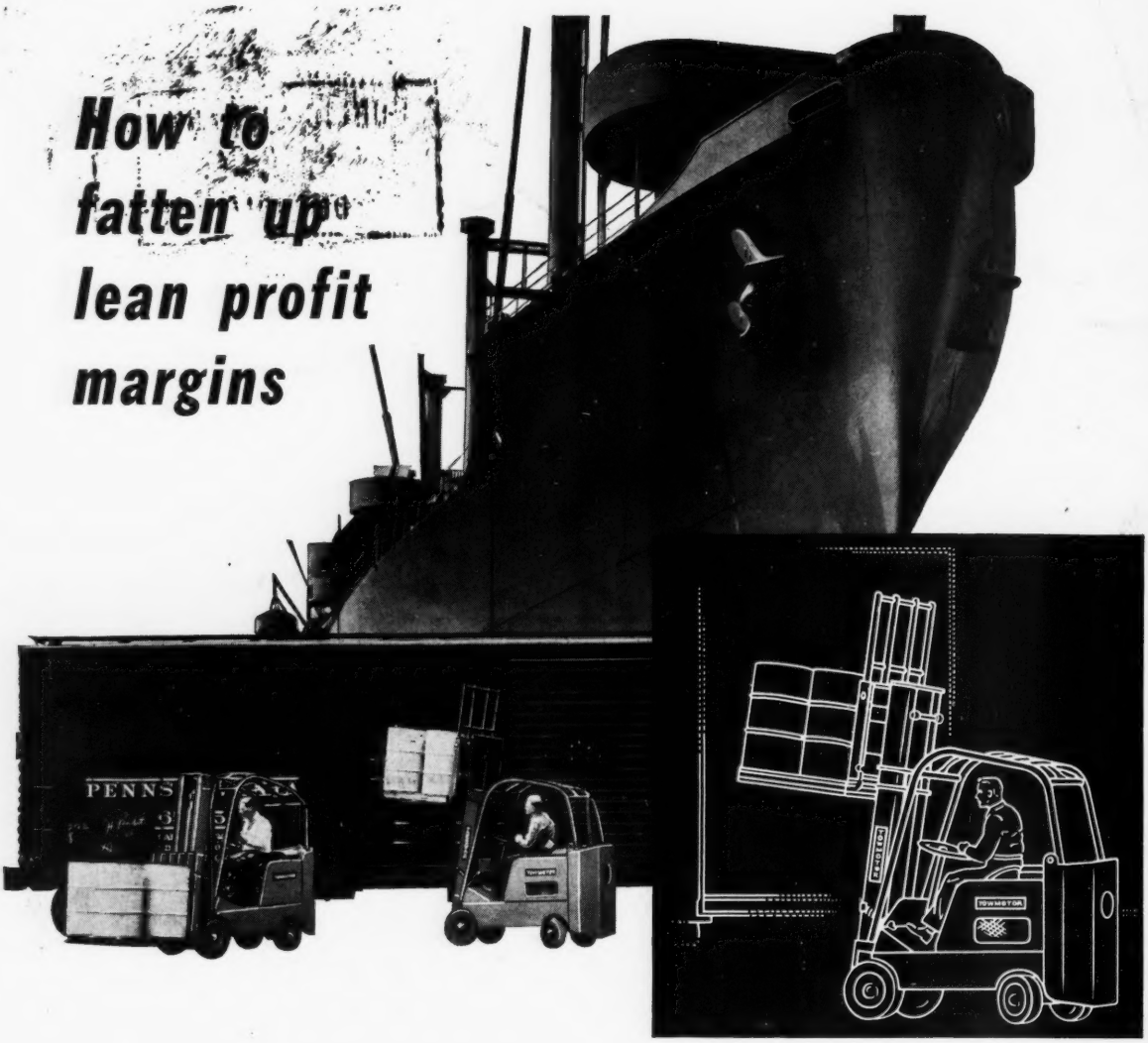
GENERAL *BOX COMPANY*

GENERAL OFFICES: 60 West Illinois St., Chicago 10, Illinois
DISTRICT OFFICES AND PLANTS: Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon, Natchez. Continental Box Company, Inc.: Houston, Dallas.



ECONOMIZE . . . PALLETIZE . . . GENERALIZE!

How to fatten up lean profit margins



In warehousing and stevedoring operations, the margin of profit is governed by the cost of handling . . . and handling costs are determined by the method of handling.

Towmotor Fork Lift Trucks and Accessories, designed for fast, systematic transportation, expedite the storage of all types of commodities, and reduce your handling costs . . . also eliminate the multiple operations required with manual handling methods.

Like to fatten up those lean profit margins? You can . . . a Pocket Catalog will show you how Towmotor can help. Towmotor Corporation, Division 8, 1226 East 152nd Street, Cleveland 10, Ohio.

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